The Builder.

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The International Health Congress.

THIS great concourse is now closed; of its excellent discussions there remain but the stenographic reports to revive the memory of those who were present, and to instruct those who were absent. An undying impression has, however, been produced, and cordial relations were established, which the most disastrous political differences will not be able to efface. Throughout all the meetings a strong spirit of internationalism was manifest. Every one felt that in France we had found the connecting link between nations; that science was above political prejudices; that the love of humanity could not recognise any limits, would not be restricted by any frontiers. These sentiments, expressed in words of poetic eloquence, were uttered by Frenchmen and Englishmen, by Dr. Richardson, delegate from America; by Baron Maydell, from Russia; by Dr. de Grosz, from Hungary; by Dr. Michaelis, from Austria; by Dr. Taderkolm, from Sweden; by Dr. Bambas, from Greece; by Senator Crocq, from Belgium; by Cobicci Pacha, from Egypt; by Mr. Jäyer, from Holland; by Dr. Felix, from Roumania; by Dr. Velasca, from Spain; by the delegate from Denmark; by Dr. Günter, from Berlin; and by Masaux Maéda, from Japan! So many men of eminence, and so much knowledge from diverse sources, but all bearing on the one subject, have rarely been gathered together; and, if the resolutions carried by such an assembly fail to produce any legislative results, we must for ever despair of governments.

Among the various discussions of special interest to us we noted a paper by Dr. Balbirnie, of Sheffield, read at an early morning sitting, and relating to the ventilation of schools, barracks, and hospitals. Dr. Balbirnie advocated a central system of warming and ventilating groups or series of rooms without being obliged to place the intake and outlet of air at the exterior of the building. This suggestion was opposed, on the ground that foul air had a tendency to accumulate in the angles of a room, and Dr. Balbirnie had proposed to place the inlet of air midway in the wall between the corners. The discussion then drifting to the general question of unwholesome dwellings, M. Belval, of Brussels, explained that in his town builders were obliged to devote at least a fifth of the site for supplying back-yards to the houses they constructed. On the strength of this principle, Dr. Perrin rose to protest that in Paris many yards were not big enough for the efficient ventilation of the houses, and expressed a hope that henceforth buildings would not be sanctioned unless a more liberal allowance of space and air was obtained. Discussions also arose in several sections relating to the lighting of schools. This question has been brought forward recently by the energetic action, the pamphlets, and eloquent speeches of M. Emile Trélat. The eminent architect argues that the eyesight of the pupils is spoilt by the confusion of light thrown into the school-room. He would apply to light the same rules as we apply to sound, and so build the school-room that the light should travel across the class without collision with rival rays, which must produce a confusing effect. If we seek to educate the ear we should not play two different tunes at once; nor ought the eye to be wearied by a conflicting method of illumination. M. Trélat, it will be seen, is seeking to introduce fixed principles for guidance in the discussion of this important subject, and we hope on some future occasion to deal more amply with his theories.

In the first section Mr. Edwin Chadwick was able to raise an interesting discussion by reading a paper on "The Necessity of Creating in each Country a Ministry of Public Health." We have ministers of agriculture, ministers of commerce, ministers of justice,—that is to say, ministers for the suppression of crime,—why should we not have a minister for the suppression of preventible disease? M. Felix, of Bucharest, suggested that such a ministry should not be subjected to political fluctuations, as it would not be practicable to change the nature of its work at every change of government. Dr. Gibert, of Havre, complained that in France there were no means of resisting an epidemic; but Dr. Pietra Santa, in a fluent speech, protested that the sanitary laws and organisations of France were so admirable that they might serve as models to all Europe. To many of his audience, however, Dr. Pietra Santa only made matters appear worse; for, by proving that the law sanctioned almost all that is necessary for the perfect sanitary government of the country, the present unsatisfactory state of affairs is still more inexcusable. Thus the assembly remained steadfast in its approval of Mr. Chadwick's proposal, and by ventilating this matter in the presence of delegates from all parts of the world, much good has been accomplished. We will give some quotations from his paper in our next.

We now turn from morning meetings of the sections to the general meetings held in the afternoon, where the six questions of the programme were discussed. Of these, there are two that specially interest us. The first, relating to unwholesome dwellings, and the second to unwholesome industries. The first discussion was opened by Professor Gubler, the president, who related that on the previous day the members of the Congress had visited the peninsula of Gennevilliers, where the soil is irrigated with some of the sewer water from Paris. They were now able to state that this gave rise to no unpleasant smell, and that the water, when once it had filtered through the earth, became quite drinkable, and was good enough to sustain a very excellent crop of watercresses, which, it is known, will not grow anywhere but in the purest water. The Congress then proceeded to discuss the Report, of which M. Emile Trélat, the architect, and Dr. Du Mesnil, member of the Government Committee on Unwholesome Dwellings, are the authors. In the first part of the report, M. Trélat discusses the respective advantages of co-operative building societies and the efforts made by large employers of labour to supply wholesome and cheap dwellings to their workmen, concluding that the latter have been most successful. Then, again, M. Trélat compares the *Cité ouvrières*, or *Cité casernes*, as they are sometimes called, where a number of workmen live together in one block of buildings, and which we generally call artisans' dwellings and Peabody Buildings, with the *Société Mulhousienne des Cités Ouvrières*, where the workmen live in separate or in semi-detached cottages, as at Shaftesbury Park Estate, Wandsworth, concluding that the latter are infinitely the best, and that the *Cité casernes* are decidedly unhealthy. These opinions, it is true, are justified if based only on French experience; but Mrs. Bovett Sturge most fortunately rose to describe what had been done in London. The mortality in the artisans' dwellings of our metropolis amounted, the lady said, only to 17 per 1,000 per annum, while that of London equalled 21 per 1,000. Further, deaths from infectious diseases were one-third less numerous in these buildings than among the other inhabitants of the metropolis. One company had lodgings for 12,000 persons, and the Peabody buildings could contain 10,000 inhabitants. To have omitted, therefore, to mention the result of experiments carried out on so large a scale, was undoubtedly a serious fault committed by the author of the report. This, however, afforded M. Trélat an excellent opportunity of rendering due homage to our countrywoman. He did not regret his omissions, since they had been so ably compensated by the facts Mrs. Sturge had brought forward, and could only congratulate himself on the happy circumstance by which the Congress had secured the co-operation of this able and gifted lady. Nor can we refrain from expressing our own sense of gratification. Mrs. Bovett Sturge, now practising in London, has taken her degree as doctor of medicine at the Paris University; and, with the exception of Mr. Adolphe Smith, was the only English person at the Congress who spoke fluently in French. We are, however, indebted not merely to her knowledge of the language, but to her eloquent speeches, to the elegance of her diction, and to the force of her arguments, for the vindication, before the delegates of all nations, of English sanitary science and sanitary reform. No one, we should add, received from all sides more homage and attention than our English lady-doctor, who, in the acquisition of her scientific knowledge, has known how to retain the modesty, the tact, and delicacy, which distinguish our best women.

The second portion of the report, by Dr.

Du Mesnil, related to unwholesome dwellings generally, and protested against the lack of light, the overcrowding, the bad and dangerous wall-papers, the dirty staircases, the leaking roofs, the damp cellars often inhabited by poor people, and notorious increase of mortality wherever we find any overcrowding. Even the improvements, the new boulevards, had been attended with some evils; as, in opening out bad quarters for the creation of rich streets, the overcrowding in the poor quarters that still remained was considerably aggravated. Finally, M. Du Mesnil suggests that a law should be enacted to the effect that the letting of furnished lodgings should not be sanctioned without previous inspection by the sanitary authorities. These latter should insist on a plentiful supply of water, on 14 cubic mètres space for each bed, on the constant washing of the walls, and on the use of paint instead of paper. This brought up Mr. Griffiths, of Liverpool, who, in a speech read for him in French, proposed that the petrifying liquid of the Silicate Paint Company should be employed, so as to keep the homes of the poor free from damp, to facilitate the washing of the walls, and avoid the dangerous use of paper. The latter not only harboured dirt, but, if it was not carefully removed each time the room was repapered, the accumulation of paste would occasion putrefaction dangerous to health. He cited a case of typhoid traced to the presence of twenty-five layers of paper left on where they occasioned an unpleasant smell, and the poisoning of the blood demonstrated by the fever. The value of the petrifying liquids was, however, criticised by Dr. Felix, of Bucharest, and M. Emile Trélat, both maintaining that silicate had often been used, and it was found that it did not last, but dropped off the walls. These assertions were, in their turn, disposed of by an official letter written to the president. The silicate to which both Dr. Felix and M. Trélat alluded, was artificial silicate of potassa, or of soda, and this certainly is defective. But the petrifying liquid in question is made from a natural silica found in Wales, resulting from a volcanic eruption. It is unlike anything else known to exist, and cannot possibly be removed when once applied to a porous wall, such as a wall of brick or of stone. The Congress then discussed the lack of water-supply, and the bad drainage of workmen's houses. M. Durand Claye remarked that the manure taken from workmen's houses in Paris contained from 7 to 8 kilogrammes of nitrogen per cubic mètre, while the manure from rich quarters contained only 40 to 60 grammes in the same volume. Many proprietors did not wish their houses to have a water-supply, as that would dilute and reduce the value of the manure produced by the inhabitants. There is already, it is true, a supply of 150 litres of water per head in Paris, but this is employed for fountains and the washing of the streets, while the drains are neglected. It further came out, in the course of the discussion, that a block building in Paris containing 1,800 working-class inhabitants, did not possess any water-supply at all. These disclosures constituted a discreditable contrast to the facts related by the foreign delegates. Senator Crocq, for instance, explained that in Belgium the Communal authorities can take what measures they consider necessary to render a house wholesome; and if its proprietor resists, the house is closed by the police. With the assistance of these rigorous measures, true typhus has been banished from Belgium. Mr. Edwin Chadwick, by the intermediary of Professor Gubler, related that in London there were houses where the inhabitants had never been free from typhus fever, but we have now enforced our sanitary laws, and have completely driven all typhus away. Mr. Adolphe Smith, in his turn, described the nature of the English Sanitary Act in relation to unwholesome dwellings, and caused no little surprise among the French and some foreign delegates by explaining that a landlord might be fined 20*l.* for letting a room in which there had been fever, unless it was properly disinfected. Finally the Congress voted resolutions to the effect, firstly, that the suggestions thrown out by French committees of hygiene should be enforced by law, and no longer avoided by the pretexts that a proprietor was not responsible for his lodger, or the lodger liable to the cost of improving the proprietor's property. Secondly, that the municipality of Paris must convey an abundant water supply to all the dwellings in the towns, particularly those situated in the working-class quarters and in furnished lodgings.

Finally, and before we eave the question of water supply, we must announce that, in accordance with a proposition brought forward by Mr. Jäger, of Amsterdam, an international association has been formed, with Mr. Edwin Chadwick, C.B., as its honorary president, for the purpose of urging the Government of each country to bring pressure to bear on all local administrations, and compel them to supply the inhabitants of their respective districts with pure drinking-water. The greater part of the foreign delegates present at the Congress, have joined this new association.

The discussion on unwholesome industries, or, at any rate, the report on this subject, issued by Drs. Gubler and Napias, is of special interest to the members of the building trade, for the chief victims are, undoubtedly the house-painters, the makers of paint, of looking-glasses, and those employed in the decoration of houses. The report describes a great number of masks and other contrivances suggested and applied to prevent workmen inhaling the lead or copper dust; but these are declared of little avail. During the course of the discussion, several speakers exhibited masks of this description. In one case the air was supplied by means of a gutta-percha tube, which communicated with the outside of the workshop, a process of breathing which must be very fatiguing to the lungs. Another speaker appeared with a huge gutta-percha bag on his back. From one tube he drew the air out of the bag, and sent it back into the bag by another tube, so that he was breathing his own breath over and over again, and the air supply must have become more and more foul. Evidently this was but a sorry contrivance; the difficulties of its application very numerous. The workmen would assuredly neglect to replenish the bag with fresh air as frequently as necessary. Thus the discussion did not alter the conclusion of the report, namely, that no satisfactory masks had yet been invented. Professor Lutschaunig's speech was consequently considered very appropriate. He argued that, so long as lead was employed, there would be cases of lead poisoning; but as paint, which is the most frequent cause of poisoning, could be made better without lead, more than half these disasters would be avoided. Professor Gubler and Dr. Napias had complained that "incurable routine is opposed to the generalisation of a process free from danger," and that, therefore, zinc white was not successful. If, however, zinc whites were made not from oxide of zinc, which has only half the covering power of lead, but, according to Griffiths's patent, from sulphide of zinc combined with other ingredients, which, while in no wise modifying the hygienic, the non-poisonous qualities of the zinc lend to this metal a body and whiteness that lead paint itself does not possess; then there would no longer be the same objections against the use of zinc. Mr. Lutschaunig insisted that he cared but little which manufacturer succeeds in gaining favour for his paint, so long as his paint cannot poison those who use it. If he alluded to Griffiths's white, it was because he was well acquainted with its innocuous qualities, and that, as there would soon be seventy-five tons of this paint produced per week, he thought the sale of so large a quantity would contribute greatly to reduce the number of cases of lead poisoning. The authors of the report have stated that "it is desirable that manufacturers should participate in the labours of the Congress of Hygiene, and explain the new methods they have invented or applied." Mr. Lutschaunig's speech was the most effective answer to this invitation, for he proposed, in the use of this discovery, a remedy which "can satisfy at once the tradesman and the sanitary reformer. In lauding this product," he continued, "we support a means of avoiding all the horrors of lead-poisoning, which is in harmony with the principles of science and the exigencies of commerce." We have, for our part, described this invention in these columns, and are glad to note that its sanitary qualities were ably brought before the notice of the Congress. Mr. Kingsett's "Sanitas" disinfectant and M. Toblet's pavilion or cottage hospitals were among the other arrangements which were discussed and approved. But the time was now at hand when business had to be laid aside and the concluding speeches pronounced.

Dr. Gubler wished the members of the Congress good speed in an eloquent outburst of feeling. Baron Maydell thanked the organisers in the name of all the foreign delegates for their admirable management and hospitality. Finally Dr. Picciotti invited the members of the Congress to meet again two years hence at Turin, and read a telegram from the municipality of that town, promising the warmest reception. This proposition was received with acclamation, and thus it was decided that the third great international congress should be held in Italy. England, therefore, can only hope to come fourth on the list.

In concluding this notice we must confess to omitting mention of the most agreeable, if not, strictly speaking, the most useful features of the Congress. We allude to the three days devoted to excursions, and to the banquets and official receptions which enlivened the proceedings. On these occasions so many good things were said that we may try hereafter to give some short account of the sanitary reformers at play.

SCULPTURE AND THE STUDY OF IT.

The subject of the suggested Gallery of Casts, to which attention was called in our last number, is one that deserves more than cursory mention. It may at once be admitted that the formation of galleries and museums, illustrative of art in its several branches, is an object that has long obtained our hearty support. It must be remembered, on the other hand, that any application for aid from the public funds for a purpose that is not manifestly deserving of national subvention, is in itself something of an injury to the worthy actual recipients of that kind of support. The aid of the tax-payer in such cases is limited, and the question of a wise distribution of such sums as can properly be borne by the budget is complicated by every appeal that is made on any but the most undeniable grounds. It thus becomes of great importance to inquire what is the basis of any claim on national support for a new gallery for the collection of casts from the antique.

It will be remembered that South Kensington has been indicated as the site for the proposed gallery, and that the sum of 10,000*l.* has been mentioned as necessary for the establishment. The figure suggested leads to the conclusion that no new building is in contemplation; but that some of the existing and unoccupied space that was provided for the proposed Perpetual International Exhibition is intended to be utilised for the new gallery. If this be so, we must remark that the first requirement of a sculpture gallery is special sculptural illumination. As a rule, the illumination of sculpture is a subject grossly neglected in England. We can only call to mind one public apartment where a proper light is obtained. That is the central hall, or lantern, of the exhibition-room at Burlington House. A piece of sculpture which has the good fortune to find a place under that downpour of light is seen under circumstances of such advantage, that a clay model placed in that apartment has a finer sculptural effect than a marble statue in a less appropriately illuminated situation. We may contrast with some figures exhibited at Burlington House since its opening the fine portrait busts belonging to the National Portrait Gallery, which, as a rule, are now deprived of their full merit and interest by being injudiciously placed on brackets in a room lighted for pictures. The shadows are thus blurred, or even reversed, and works of art of much value are made to look like cheap and trumpery ornaments of an ordinary apartment. It is impossible to insist too strongly on a point as to which we have not only the authority of the great artists of the past, but that of common sense. The experiment can be made. A head, or a whole figure, may be seen casually lighted, and afterwards lighted in a mode adapted to its design. We may instance the lovely bronze female masque,—a Medusa or a Hypnos,—acquired by the British Museum a few years ago. When first placed in the cases of the bronze-room, it required the eye of an expert to detect its great beauty. It has been subsequently placed in a central position, under a vertical illumination; and its wonderful life and force arrest the admiration of the most casual visitor. We are of opinion that the arrangement of specimens of sculpture in rooms or galleries not especially constructed for the purpose of their display, under the direction of a sculptor or of an expert in sculpture, would do more harm than good. This is only a matter of detail, but it is a detail of the utmost moment. The relations of the sculptor and of the architect cannot be ignored, without injury to the works of the latter, and destruction to the value of those of the former.

Two points require establishment, in order to support any such demand as is now made for public money. One is the desirability of the new collection in itself. The other is the question of site. The two are, indeed, intimately connected. If the first position be established, viz., that it is of public importance to have the new gallery, the second question will, sooner or later, have to settle itself. But we have to ask how such an institution is supposed to be calculated to carry out the professed objects of the twenty-four gentlemen who have lately addressed a memorial to Lord Beaconsfield praying for Government aid in the establishment of an historical gallery of casts from the antique?

These gentlemen are, first the head masters of Eton and Harrow; then those of the City of London School, Merchant Taylors, Christ's Hospital, Dulwich College, St. Paul's School, and Westminster; and thirdly, professors and masters of University and King's Colleges, London. The first question is, How is a new London gallery to be made available, not only for students within the metropolis, but for those of such outlying schools as Eton and Harrow? Next, we must inquire in what manner is it intended to make the new gallery at South Kensington serviceable to the purely London establishments?

We are wholly in accord with the prayer of the memorial in considering that it would be of very great service to the rising generation, and to the country at large, "if provision were made for the delivery of lectures upon the history of Greek sculpture." That these lectures may be, to some extent, illustrated by casts, is no doubt the case. That they may be with much more force and good effect illustrated "from the collection in the British Museum," we hold to be undeniable. But how, let us ask the memorialists, is the provision of lectures, or their illustration from the priceless fragments of the noblest Greek art now to be seen at Bloomsbury, to be forwarded by the establishment of a separate gallery of casts, nowhere in the vicinity of the Elgin marbles? There is a want of connexion here which looks as if the learned men who memorialised the Prime Minister had been more ready to sign than to reflect on the purport of their memorial.

Far be it, however, from us to suggest anything more than a momentary want of consideration. We are only too happy to see such names as those of Dr. Hornby, Dr. Montague Butler, Dr. Abbott, Dr. Baker, Dr. Barry, Dr. Scott, and Mr. Walker, pledged to the opinion that the higher education of classical scholars will be promoted by the establishment of a lectureship on Greek sculpture to assist at anything which may tend to promote so desirable an end. Our only wish is, that that end, now admitted to be desirable, should not be lost sight of for a moment until it is fully attained. And therefore we must be pardoned for the suggestion that it may be attained more rapidly, certainly, and effectively, by a very small degree of concord between the eminent memorialists themselves, than by any application to the Prime Minister. The pithy lesson of the fable of the lark and her young ones should here be remembered. When the head masters set themselves to the task of looking for a fit lecturer on sculpture, the lectures will be readily forthcoming.

We speak with the more earnestness on this subject from the fact that such an idea has long been more or less distinctly intimated in our own columns. We have lamented that England has not of late encouraged any one to attempt for sculpture what Sir Joshua Reynolds, to some extent, effected, for painting. We say to some extent, for, though the lectures of this eminent man still remain without being displaced by a fuller and more systematic treatment of the subject, their inadequacy to form an introduction to the present study of art is unquestionable. We have recently referred to a much earlier example of an attempt to produce a systematic introduction to graphic art in the treatise of Leonardo da Vinci on painting. Perhaps the subject of aërial perspective has never received more proper consideration than by this great artist. But the geometry of his linear perspective is confused, when it ought to be simple. The lectures of Flaxman may be remembered. But Flaxman so far failed to breathe the vitality of nature into his reproductions of Classical types that in the handbook of his journey through Italy we cannot find a single instance of a sculptor's model drawn from life. Yet the Greek type is still to be found in many parts of Italy, and sculptural models, of pose as well as figure, are readily to be seen bathing in the summer waves of the bays of Naples, of Salerno, and Otranto. When we look further, as to the bibliography of art, we find that not only do we borrow most of our light, but that we only borrow that which we can obtain at a low price. We look in vain, in the art catalogue, for a translation of the "Laocoon" of Lessing; of the Polyclète, or other works of Schadow; of the "Proportions du Corps Humain" of Audran; of the "Bücher von Menschlicher Proportion" of Albert Dürer; of the "Œuvres complètes de Michel-Ange"; of the "Tabula Anatomica" of Leonardo da Vinci; of the "Monumenti Antichi inediti" of Winkelmann. There is an English translation, as well as French and Italian versions, of the "Geschichte der Kunst des Alterthums" of the latter writer, of whose writing there exist forty volumes in German, French, and Italian, to three in English. Of Flaxman's lectures on sculpture a third edition was published in 1849. Westmacott's "Handbook of Sculpture" is "adopted from an essay contributed to the 'Encyclopædia Britannica,'" and was published in 1864. One lecture was delivered by this artist before the Cambridge School of Art in 1863. Lubke's "History of Sculpture" has found a translator and a publisher, thanks to the facilities afforded by electrotype for the reproduction of the drawings of German artists. M. Taines's five works on the philosophy of art have found a translator, not in London, but at New York. The works of La Croix, Viardot, and others are rather fitted to adorn the library or the drawing-room than to aid the lecturer. The more one seeks for English works on the theory, history, and practice of sculpture, the more do we see the need of a composition of a standard work, fitted for the guidance of the student, and written with an express view to illustration by visits to our existing collections of sculpture.

It has not been without a view to the supply of this great gap that we have ourselves from time to time called the attention of our readers to certain main principles underlying the study and practice of art, whether graphic, chromatic, or glyptic. We may cite articles on Ornamentation (March 11, 1871); on the Antique: its study or restoration (Feb. 3, 1871); on Grandeur in the antique (March 30 and May 25, 1872); on Scale (June 29, 1872); Motion (Sept. 28, 1872); Shadow (Oct. 12 and 19); on Sculpture, Criticism, and Record (Dec. 28, 1872); on the Real, the Conventional, and the Ideal (March 8, 1873); on Colour (April 19, 1873); Form (Aug. 9, 1873); Proportion and Symmetry (March 7, 1874); Grace (July 6); early Art-work in Gold (Aug. 8); in Copper (Sept. 19); systematic Education in Art (Oct 31, 1874); and Beauty (April 22, 1876); as forming, among many papers of more special character, a sort of thread of reflections such as must be presented by any lecturer who would bring a clear view of the art of the past before the attention of the student of to-day. While art in general has been the theme, there are some of the above articles, such as those relating to shadow, to form, and to grandeur, which are more specially devoted to the rudiments of the art literature of the sculptor.

In another direction we may cite an article on the "Canon of Beauty in Greek Art," which appeared in No. 285 of the *Edinburgh Review*, and which gave some account of the bibliography of the important subject of human proportion. The latest admeasurements of the growing child, in Germany, were here compared with data taken from the finest Greek statues. And a modulus, or automatic scale, was then suggested, by use of which the comparison of proportions was reduced to the utmost simplicity; and painful specialisation, such as that of Audran, is replaced by direct reference to the canon followed by Phidias and his contemporaries. In any new lectures on sculpture it will be necessary to give a full account of an investigation which throws so much light on the traditional, exact, and unwritten rules of Grecian art.

Even the past few months have witnessed discoveries which fill up an enormous, and heretofore unbridged gap in the history of sculpture. In our notice of the discoveries of Dr. Schliemann at Mycenæ (15th of December, 1877), we pointed out how this gap was once filled. A few years ago Greek sculpture, for all that could be positively stated to the contrary, sprang perfect from the soil of Athens, in the time of Phidias, as the olive and the horse were said to have sprung up at the voice of Athene and of Poseidon. It was only deductive reasoning, or sculptural instinct, that led to the idea which we have ventured to express, that what the sculptor's art owed to Phidias was not so much a new touch as a new material. For bronze, silver, gold, and ivory he substituted the rougher, but more enduring, material of marble. The Apollo Belvidere is one of those figures of antiquity which suggested the former existence of a lost branch of sculpture with great force. There is no doubt that that noble work is but a Roman copy of a Greek original. The want of exactitude in the dimensions of the legs, compared with each other, alone is a proof of this. It is also tolerably clear that the marble suffered much from the sacrilegious chisel,—or, far worse, file,—of Bernini, when it passed into his hands. Its first discovery was made by Raffaelle, who immediately started for Rome to inform Pope Julius II. of the good fortune that had led to its unearthing at Ostia. So eager was the Pontiff to behold the statue, that, although on the point of retiring to bed when the painter sought an audience, his Holiness gave immediate orders for a journey to Ostia, and saw the statue for the first time by torchlight. The left ankle, which bears much of the weight of the figure, is an inch larger in girth than the right. When this fact is compared with the peculiar extension of the arm, with the arrangement of the chlamys, and with the accentuation of the trunk of the figure, we see every reason to conclude that the original was in bronze; and that such departures from the precision of the canon of Polycletus as were thought necessary, mark a change in material as well as a later period of art.

That the original of the Apollo Belvidere was a bronze or a silver statue was thus an opinion very explanatory of difficulties otherwise hard to read; and that, not with reference to that individual statue alone. If Greek artists, down to the time of Phidias, wrought in metal, it is easy to understand the absence of specimens which marked and dated the progress of the sculptor's art. Bronze is highly perishable under circumstances which hardly affect marble. Silver, gold, or metal with silver or gold fittings, of course presented a tempting bait to the greed of the barbarian. Greek coinage is traced as far as the eighth century before Christ. There are electrum coins, evincing no small command of the art of the die-sinker, of the sixth century. But the discovery at Mycenæ of the golden masks which were interred with the important personages whose remains were discovered by Dr. Schliemann furnishes a positive proof of the use of metal eiconography at a date far earlier than the apogee of Greek sculpture.

It is thus certain that we are now in a position to take a more intelligent view of the history of sculpture than was competent to Flaxman, or to any one of those Italian, German, or French sculptors or critics to whom we have hastily referred. We therefore hold, not only that gratitude is due to those promoters of high education, who have pointed out the propriety of connecting the study of Greek and Latin authors with the study of Greek and Latin art, but that the time has come for a more exhaustive dealing with the subject than has yet been attempted. It should be grasped in its entirety. The bibliography of sculpture must be summarised; the history of sculpture must be traced; and the learning and the practice of the subject must be illustrated by reference to those objects of ancient art in which England is unusually rich.

But what the public seems to forget is, that our sculptural wealth is not confined to the priceless relics of the Elgin and Phygaleian marbles, and other treasures of the British Museum. We have at this moment, within a few miles of London, a collection of casts from the antique, on which no cost was spared, and which, at all events, when new, was unique. Most unfortunately, the whole stock of the Handbooks to the Sculpture Gallery of the Crystal Palace perished in the great fire. They have not been reprinted, and copies are not easily to be found. But the casts themselves exist, arranged, many of them at least, in chronological sequence, and illustrated by architectural reproductions. Unless more damage has been done than we are at all prepared to admit, we have under our hands, at the Crystal Palace, precisely such a collection of casts from the antique as it is now proposed to form *de novo*. Why not make adequate use of what we really have?

And this leads to another reflection as to museums, both special and general. We very much fear that their true educational value has

been of late much misunderstood. Teaching by the eye is of the highest value, provided it be teaching; but a museum no more teaches of its own accord than does a dictionary. In fact, a good museum is a dictionary,—not of words, but of objects. For illustration, explanation, verification, its use is essential; but it wants the living voice. A collection is not of itself fully a teacher. It is the apparatus of the teacher. In nine cases out of ten more information will be derived from a teacher without specimens, than from the specimens without a teacher. We look from the side of a vessel, it may be, with half-intelligent gaze, on shore, and wood, and river. Scene succeeds scene; and if we rush through a country like our typical Western neighbour in his frantic haste to "do the Continent," what are we the better for our tour? But when the voice whispers in our ear, and the finger points in illustration of the quotation,—

"Hac ibat Simoïs; hic est Sigeia tellus
Hic steterat Priami regia celsa senis,"

with what new glory is the scene illumined? The admirable scene in the "Taming of the Shrew" may be taken as illustrative of the function of the teacher, and of the quaint discords to be drawn by his perverted ingenuity from books or from objects of art. "*Hac ibat Simoïs*,—'I know you not.' *Hic est Sigeia tellus*,—'I trust you not.'" The one comment which fell on the ear of the present writer on one of the first days of the admission of the general public to the Great Exhibition of 1851 referred to a statue of Pan, and it was in these words, "Look at that 'ere covey with a tail!"

It is not to be understood that we are arguing against the establishment of a museum of casts. The idea is very attractive, and such an institution would be very useful in many respects. We have ourselves sketched out the lines on which it should be founded. All we now say is, that the proposal should first have full consideration and discussion.

Experience of the British Museum and of the South Kensington Museum has shown one thing with unexpected force. That is, that the effort to combine teaching and amusement is likely to result in failure. The more thoroughly a gallery is arranged as a self-teaching exhibition, the less does it attract interest as a sight. Nor is this the case with the ignorant alone. It is the case, to a great extent, with the cultivated man,—even with the specialist. Thus, a man who has taken a warm interest in classificatory natural history, devoted years to the study, and eagerly sought all sources of information, finds his courage flag on a visit to the Zoological galleries of the British Museum. There he will find, in their proper places, objects which, singly, he would have travelled miles to see. But the dead, sombre, mechanical effect of the lines of bird or beast mummy have a disenchanting, paralysing effect on the eye. The long rows look like the columns of a dictionary. There is not even the excitement of turning the leaves. There is the absence of that interest in the hunt which seems to be needful, in order to fix details, one by one, in the memory, and which is certainly necessary to the enjoyment, and perhaps to the utility, of study.

We hope that this idea of a course of lectures on Greek sculpture will not be allowed to drop. Its importance has now been formally acknowledged by the principals of our most famous public schools. For the illustration of such a course we possess specimens of the highest value, casts of an exhaustive variety, and photographs which complete the catalogue. The sculpture of the world is represented in England; but English literature is silent as to its history, its grandeur, and its teaching. It is time that the reproach of silence should be removed. For our own part we can only say, that if the headmasters and professors who have borne testimony to the need of lectures of this kind have the consistency due to their expression of opinion, their wishes may be at once carried into effect. Let scholastic institutions offer that degree of support which can not, in the present state of education, be expected from the public, and the completion of a series of lectures worthy to serve as an introduction to the study of antique art, illustrated by reference to our own treasures, and to representations and *fac-similes* of those of Italy, Greece, France, and Germany, may be counted on with prompt certainty. We shall be glad to receive any communications on the subject.

OBSERVATIONS ON THE PROGRESS OF MODERN GREECE.

The enthusiasm which the very name of Greece roused among Englishmen some fifty years ago is now a thing of the past, but yet there can be very little doubt that though we now regard Greece in a calmer spirit, there is still a great deal of real interest felt in the future of that country. The history of the last two years has once more turned the eyes of Europe to the East, and necessarily, therefore, Greece and her people have again attracted the attention of the world. But there is a current fallacy in regard to this question which has been caused to a great extrent by the settlement of 1830. People have become so accustomed to the present territorial extent of the kingdom that they are inclined to regard the acquisition of Thessaly, Epirus, and Crete as almost showing a lust of conquest in a young and struggling nation, whereas these three places really form part and parcel of modern Greece; their inhabitants were the first to rise in rebellion against the Ottoman rule, and it was only by the accident of diplomacy that when Greece, as it now exists, became independent, these, the best parts of the land, were excluded from the independence which they deserved, and have consequently remained, and will remain, a perpetual source of bloodshed and rebellion until they receive the freedom and the self-government to which they look forward as an integral part of the kingdom of Greece. In all notices, therefore, on the state of modern Greece, it must be well remembered that the kingdom is not yet by any means possessed of those lands and peoples who are the most necessary for her full and complete development. But the progress, under all its difficulties, of modern Greece shows plainly how earnestly all politicians should strive to give to the present kingdom those other portions which are needed to make a prosperous and happy nation out of rebellious vassals and a struggling principality.

There are many phases of this development which would not come within the scope of subjects treated of in our pages, but, on the other hand, considering the renewed interest with which the Hellenes and their land are now watched, it will not be out of place to devote a short space to some points which fall within the range of matters to which we are in the habit of drawing our readers' attention.

Greece is eminently a maritime country; she is, in fact, almost an island, even without taking into account those "Isles of Greece," whose glowing beauty has formed no unworthy subject for the poet. It is essentially, therefore, one of the first duties of such a kingdom as Greece to develope the capacities of her ports, and if she has done this, it is certain that she is making a decided, though it may not be a rapid progress towards a greater state of prosperity. Under the dominion of the Turks decay and desolation flourished, and it is one of the strongest arguments in favour of the emancipation of those Grecian provinces still beneath the Ottoman rule if it can be shown that the progress of free Greece has been reasonably rapid, taking into account the overwhelming difficulties from poverty, and from the troubles of the surrounding lands, against which she has had to struggle.

Let us take first the historical Piræus, the port from which the triremes of ancient Hellas went forth to conquer or to civilise the barbarians of the surrounding lands. In 1830 it was full of mud and sand, and hardly accessible even by the fishermen's boats; to-day it is an admirable port, deep and large, and alive with vessels of commerce, and contains war-ships of all nations. Another remarkable instance is found in the harbour of Chalcis, which forms the chief town and port of the fertile island of Eubœa, and of the eastern parts of Attica and Bœotia. For years the harbour could not be crossed by vessels which drew more than about 10 ft.* on account of the channel which divides the island from the mainland being choked with *débris*, but now its enlargement has been undertaken to the extent of twenty-one yards and a half and to the depth of six yards, and a movable bridge has been stretched across, so that constant communication can be kept up between Bœotia and Eubœa, and vessels which have to go through the channel can now do so instead of sailing the whole way round the long island of Eubœa. The expense of the work in question has been 952,000 drachmas (850,000 francs), which may be roughly set down at 34,000*l*. Here is an excellent example of the effect of the struggling civilisation of Greece, as compared with the lethargic barbarism of the Turks. The Ottoman Government had years during which this most necessary piece of work might have been done, it was never undertaken, and never would have been performed; but no sooner are the poverty-stricken Greeks free, than with their commercial instinct they at once set to work to remedy the existing state of things, and thereby benefit themselves and all other nations of the world. The same thing will be witnessed in Cyprus where the ports are in the same condition as were those of Greece when she became independent; and every single piece of increase in material prosperity which the islands of the Mediterranean and the lands of the East witness done by the hand of the stranger or the freedman adds another indictment against the Ottoman rule, and is another step towards its inevitable disappearance. We might mention yet other instances, such as the construction of a mole 300 yards long at Patras, of a breakwater at New Corinth, and many works of a similar kind. But another matter of a like kind forms a pregnant example of what Greece has done for commerce in the East. In 1847, M. Leconte, the well-known writer and traveller in Greece, wrote thus:—"A single lighthouse has just been constructed on an island close to Syra, but navigators say that it is absolutely necessary that they should be built on four other spots." But at the present day the Government have placed lights of different degrees of strength not only on four other places, but on forty-six points, visible from thirty down to five miles in distance.

And if we turn to the towns, the same progress is visible. Look on this picture of the Piræus, as described in the earlier years of this century, before the independence of Greece by Count Pecchio and M. Lebrun, in 1825. "I awoke," says the former, "under the pleasant sky of Attica, and my eager glances sought the Piræus,—the celebrated Piræus,—but, to my great distress, I saw only an insecure port, and some ruins scattered along the seashore." "And," says the latter, "the Piræus is nothing more now than a deserted bank, of most miserable aspect." Now look on the Piræus of 1878,—"solid and useful quays, markets regularly built of stone, squares, places, and fountains are everywhere visible, looked after with the greatest care." Take even Athens itself; it is now a town of 70,000 inhabitants. It contains 5,000 houses. The mere enumeration of the new buildings shows how things have changed: a royal palace was built by King Otho; a University has also been erected, a large building, with several wings and a graceful and simple façade. It contains two side courts, paved with marble. Externally, and close to the façade, there are two marble statues, one of the Patriarch Gregory proclaiming the independence of the Greeks, the other of the poet-martyr Rhigas Féréos, who was executed in 1798, and whose patriotic songs are still fresh in the memory of the Greeks. Another statue placed in front of the university buildings does honour to the memory of Coray. Each of these works was executed by the hands of modern Greek sculptors, and shows at once that the men of to-day seek to do honour to the patriots who have gone before them, and who have lost their lives in the wars for independence, and also to show that they themselves desire to excel in the arts of peace. Close to the University is the Academy, a building of marble, in the Grecian style: the gift to Greece of one of her sons, who lives habitually, like so many more in foreign lands, not in his own country, viz., Baron Sina, of Vienna. Then there is the School of Art covered with marble work; the Chamber of Legislature, opened in the course of 1876; the offices of the various ministers; the fine Museum (the gift of M. Bernardaki); and the Observatory, founded and endowed by the generosity of Baron Sina. It would not be difficult to go through various new towns, or old ones rebuilt, there. On the site of ancient Sparta a new and modern Sparta is growing up with regular streets, a prefecture, and various departmental offices. But it is sufficient to say that forty-eight new towns have been built according to modern plans, and numerous others repaired and renovated in various ways. Greece may be far from that state of security and prosperity to which she might

* We take the statistics and information contained in this paper from a recent voluminous and compendious work of the Blue Book character, "La Grèce telle qu'elle est. Par Pierre A. Morsaïtinis, Ancien Conseil de Grèce. Athens Libraire, Karl Wilberg; Paris, Firmin Didot et Cie. 1877."

ultimately attain, but looking to the ruins from which she has raised herself, and to the towns rising up on her surface, the words of Horace are not a little applicable,—

"Merses profundo, pulchrior evenit."

Finally, we may turn from towns and harbours, and note briefly some points connected with the School of Art. Passing over the years from 1837, when the School of Art, under the title "Polytechnique School," was founded at Athens, to the year 1867, we may pass to the present time, when this institution is housed in a fine building recently completed, which the country owes to the generosity of MM. Stournari, Michael and Hélène Tossitza, and Averoff. Indeed, no feature of the Greece of to-day is more noticeable than the way in which private individuals, who are frequently residing for a large portion of their lives in foreign countries, where their energies have a larger scope, have employed their wealth in the erection of new buildings of a handsome and durable character in their own land. It shows plainly enough that as soon as the country is secure in the hands of its own people, and free from the domination of the stranger, the Greeks of to-day are only too willing to lavish on it their riches, as their fathers did their blood. But to return to the School of Art. It is attended by 300 pupils, who are presided over by a director, a secretary, eighteen professors, a director of the mechanical workshop, a mechanician, and six other *employés*. The instruction itself is divided into the following sections: Painting, sculpture, xylography, chalcography, ornamentation, mechanics, architecture, and geometry. It also possesses a library, a museum of sculpture, a picture-gallery, and a mechanical workshop for the practical teaching of the pupils. The objects of its existence are, in fact, twofold,—the instruction of artists in the highest kinds of art, and the teaching of various artistic theories which will benefit the artist and the workman. There is clearly, therefore, an endeavour always continuing to improve the character of the Greek people as artists and as workmen; and we must again repeat that the larger the kingdom becomes, and the more fertile land there is added to the present territory, the greater will be the possibility of an increase in its material prosperity; for, whilst the neighbouring provinces of Epirus and Thessaly are in constant rebellion, it is absolutely hopeless to expect that the arts of peace will thoroughly flourish in a kingdom in which every man feels himself almost a brother of the Epirotes and Thessalians across the border.

It is scarcely necessary to say anything as to such things as the two large machine manufactories established in 1860 and 1871, nor yet as to the improved state of the roads of Greece, which is another piece of evidence of the manner in which civilisation progresses in this little kingdom. The Government have done much in this direction, though much more yet remains to be performed.

But what has been said here will show plainly that Greece, since the proclamation of its independence, has been steadily increasing in prosperity, and that it possesses an organisation and institutions which are well fitted for a larger kingdom. This is not the place to go into the question of politics or finance. What we have been desirous of directing attention to is the manner in which handsome buildings have sprung up, towns have been rebuilt, harbours deepened, and a school of art which has already produced several able artists, such as Drossi, the sculptor, and Volonakis and Prassalentis the painters, has been founded. We quite admit that various evils still exist in great strength, officialism is rife, brigandage is not wholly suppressed, though it is greatly lessened; but it must be borne in mind that this kingdom has had much to contend with, and whilst shaken by every trouble in the East, has yet, as we have seen, had time to improve its material character, and to set up institutions which are calculated to revive the arts and establish trades and handicrafts, which will, it is to be hoped, at no distant date, give back some of its ancient prosperity to this country. Constantinople for the Greeks is the dream of mere enthusiasts, but the creation of a compact and prosperous Hellenic kingdom is not only a possibility, but in a certain number of years a certainty.

Barnard Castle.—The operative masons of Barnard Castle have resisted the proposition of the masters for a reduction in the men's wages equivalent to 1s. 8d. per week.

BABYLONIAN LAND LAWS.

When men began to abandon the nomadic mode of life and became settlers and agriculturists, there very soon grew up the want of some communal laws as regards the rights and responsibilities of landowners. It became necessary to find some means by which to fix the boundaries of the property of each individual, and to regulate and govern the system of land transfer.

Herodotus informs us that the ancient Egyptians had at an early period invented a system of geometry or land-measuring, and he gives us a very lucid reason in support of this statement. The annual inundation of Lower Egypt by the periodical rise of the Nile, and the frequent obliteration of all landmarks by which every man's property was known, rendered it necessary to have some means by which to ascertain the boundaries of the lands belonging to each person. In addition to this, the Egyptian system of land grants by which all land was state property, and the revenues being furnished by taxes in proportion to the amount of land held, all necessitated a strict system of land surveying. The existence of carefully-drawn surveys of the royal tombs, and of the gardens attached to houses, as well as a map of the mines in the Peninsula of Sinai, all show that such a system of land mensuration was in vogue in the Nile regions. The simple problems solved in the geometrical papyrus in the British Museum show that such surveys were carried out according to scientific principles. Herodotus informs us that Sesostris, by whom probably is meant one of the Rameses, sent proper persons to survey and measure land which had been submerged and lost by the rivers rising, in order to adjust the taxes with equitable proportion to the amount of land held.

The reasons advanced by the father of history are equally applicable to the domains of many other lands, especially to such as have a periodical inundation by their great rivers,—as, for example, the far Eastern cradle of Turanian civilisation on the banks of the Hohang-ho and the Yang-tze-Kiang, or the land of Babylonia, the twin-sister civilisation to Egypt, where the annual rise of its dual streams of the Tigris and the Euphrates furnished life and nourishment to the lands on their banks.

Considering the very early period at which the land of Babylonia was occupied by an agricultural and land-holding population, we may certainly expect to find some traces of laws and regulations relating to the rights and duties of these early landlords.

An examination of the cuneiform inscriptions shows us that at a very remote period, more than 2,000 B.C., the laws relating to property had been tabulated and recognised, and were rigidly enforced. By the law tablet (Wa. I. II. 10) one of the most valuable inscriptions in the British Museum, we learn that the rights of possession extended over lands, houses, slaves, male and female, and even embraced the private sanctuaries or shrines of the household gods. A man could leave property to his son or brother, but had not the right to compel him to reside upon that estate, and the presence of a man's landmark or boundary-stone was a proof of possession, and formed the title-deed to the land in question; and married women were entitled to hold land and estates in their own right. Considering that such laws were in existence, we may naturally expect to find some rules and regulations as to trade in land. In this we are not disappointed. In the second volume of the "Cuneiform Inscriptions of Western Asia," pl. xiii., we learn that an estate consisted of the house, the field, and the plantation or grove, and that the system of mortgage by real security was in vogue at a very early period. In lines 27-29 of this tablet we read, "In regard to the interest on his silver [money], his house, his field, and his plantation, as security he has placed." The grove or plantation, which was frequently mentioned as part of the estate, was the palm-grove, which formed an adjunct to every house. In the mythological texts we find one of the most frequent similes for extreme prosperity was, "Thou shalt flourish as the trees beside the door." It is curious to notice that the Babylonian name of the date-palm was *sulu$_{x}$ū*, a name which is preserved to this day in the Arabic *salaf*. From the fruit of these trees the tax of first-fruits was collected. The act of pledging or raising money by mortgages on the estate is frequently mentioned in the early commercial documents of Babylonia. In the text quoted above we read "His house for silver he has laid a burden on" (*i. e.* pledged), and even slaves, male or female, and in some cases the man's own person, could be pledged to raise money. An example of such a transaction as raising money by personal security is found in an inscription, where we read,—"For his liberation silver he has weighed." The money mostly being in silver, the term "silver" may frequently be taken in such a sense as money in the present time. The written terra-cotta tablet which formed the memorandum of such transactions was called *sipartu*, or "written deed," and was drawn up with great care, and most carefully attested and sealed.

In no museum in the world, excepting the unopened treasure-heaps of buried Babylon, is there so fine or so regular a collection of commercial documents as in the British Museum. From the eighteenth century before the Christian era, until less than a century before that epoch, there are in this collection documents recording transactions which have taken place in the marts of Nineveh or Babylon.

Space will not permit me to mention more than one or two of the finest of these documents which enrich our national Museum. Among the early tablets are several written in the Accadian or old Turanian idiom of the early Babylonians. These documents are dated in the reign of King Khammvragas, who was one of the most energetic and warlike of the early Babylonian kings. It is important to notice that in many of these documents, one at least of the contracting parties bears a Semitic name, showing that even at that early period the Semites were the chief traders. One important document of this early series is written entirely in Semitic, showing that the language was held in sufficient importance to be used in commercial transactions. About a year ago I discovered a long bilingual inscription of this monarch recording various great events in his reign, which shows that the Semites were so important an element in the population of Babylonia as to require a royal proclamation to be a bilingual.

One of the largest and finest of these documents relating to gifts or sales of land is the boundary-stone bearing an inscription of Merodach-baladau I., B.C. 1200, which was presented to the trustees of the British Museum by the proprietors of the *Daily Telegraph*. This stone was placed at the corner of a plot of land presented by the king to a person named *Merodach sum-izakir* as a reward for his services to the state. In this document, although the dimensions are not given, the greatest possible care is taken to give all the adjacent and bounding properties, and the deed is attested by numerous witnesses. To the document is appended a long list of pains, penalties, and curses which will be visited upon the head of the unfortunate individual who injures the landmark of the royal donor (Deut. xix. 14; xxviii. 17).

Two very interesting documents in the collection are two conical black stones from Babylon which record sales of land in the reign of *Merodach-iddin akhi*, a king of Babylonia (B.C. 1150), a contemporary with the great Assyrian king, Tiglath-pilieser I.

One of these is of great interest on account of the price of the field having been paid in kind, in lieu of the 616 *mana* of silver, and an inventory of the objects given, with a valuation of each, is given in the document.

Among the items, we may notice "One chariot with its harness for 100 (pieces) of silver." Six riding-horses, equal to 300 (pieces) of silver. "A cow in calf, some asses and mules, as well as numerous pieces of cloth." These, we are told in the inscription, "are in lieu of 616 pieces of silver." This document furnishes us with the name of the surveyor who values the land, — his name is "Sapiku," the son of Merodach-baladhu, — and he is termed the *Masakhu*, or the measurer of the field. Appended to this document are numerous curses on the mover of the land-mark.

During the period of the Assyrian empire, commerce flourished to a considerable extent at Nineveh, and its land transactions may best be illustrated by the following translation of a tablet relating to the sale of a house at Nineveh in the year B.C. 640:—

1. The House with its woodwork and doors
2. Of Idpaic, in the midst of Nineveh,
3. Adjacent to the house of Rubu-Nabu,
4. Adjacent to the house of Dabir-Istar,
5. Adjacent to the house of Shamas-irba,
6. Adjacent to the established street.

7. The house which is in the midst of Nineveh
8. is built by KULLALAI.
9. From PAKANA-ARBA-IL for Sar-Istar,
10. For the sum of half a MANA of silver he has taken.
11. The full price is given, this house.
12. The lease is taken.
13. The deed is drawn.
14. It is done, there is no withdrawal.
15. Whosoever at a future day or at any time
16. Shall violate this contract, or this property,
17. Whether it be PAKANA-ARBAIL,
18. Whether it be his sons, or his sons' sons,
19. Who from KULLALAI,
20. his sons or his sons' sons,
21. This confirmed deed shall violate,
22. 5 MANAS of silver he shall give.
23. Witness in the presence of Isid-Nabu, the chief of plantation.
24. Witness in the presence of Kal-zir-Dabu Assur, the chief of plantation.
25. Witness in the presence of Tirya, the chief of plantation.
26. Witness in the presence of Khirurya.
27. Month Iyar (II.) 10th day in the Eponym of ASSUR-LADANI,
28. In the presence of Nabu-akhi-iddina, the Judge.

Here we have the deed of the sale of a house which took place in the eponyeme year of a person named ASSUR-LADANI. By the occurrence of this name and the assistance of the canon of these archons or eponyms we are enabled to fix the date of this document. There are a great number of documents of this class in the national collection which relate to commercial transactions in lands, houses, fields, and slaves, which took place in the great marts of Nineveh or Kalakh. But the number of Assyrian commercial documents in the British Museum is very small compared with that of the Babylonian, of which more than half the collection consists.

In the year 1875, the trustees of the British Museum obtained by purchase, from a dealer in Baghdad, a collection of more than 2,000 inscribed cuneiform tablets, of varying sizes, from ½ in. by ¾ in. to 8 in. by 12 in. These documents, on their arrival in England, I found to belong to the class known as contract-tablets, from their contents relating to commercial transactions and contracts. These tablets were found in one of the mounds on the site of ancient Babylon, but in which I have as yet not been able to ascertain. They were found deposited in a series of earthen jars, the tops of which were covered by a plain tile sealed to the jar by bitumen. Immediately on their arrival in England I commenced an examination of these important records of the past, and soon found them to be of the greatest value. My first researches were directed to the dates attached to these documents, which were of the greatest possible value for the settlement of the much-vexed questions of later Babylonian and Persian chronology. The result of this examination I have published in a paper in the Journal of the Society of Biblical Archæology, vol. vi. Some idea of the complete sequence of the series of dates formed from these tablets may be obtained when it is mentioned that, from the first year of Nebuchadnezzar, B.C. 605, until the last year of Darius Hystaspis, B.C. 486, there is hardly one year unrepresented by dated documents. In addition, many of the most difficult points in Biblical and Oriental chronology have been settled by the examination of these documents.

A very slight examination of these tablets sufficed to show that there was not only a regular sequence in the chronological order, but that they all were derived from one and the same source. They were, in fact, the commercial documents and papers of a great Babylonian firm of bankers and State land-agents, trading in the name of EGIBI & SONS. Among these tablets are found terra-cotta memoranda, representing every kind of commercial and fiscal transaction, land sales and leases, loans and mortgages, loans of money, sales of slaves and property of every description. In the State portion we find lists of temple offerings, receipts for taxes, lists of unpaid dues and claims, law cases, letters, and arbitrations. In documents relating to land transactions this firm is extremely rich, and a most important document in this section which I have discovered I now lay, at the request of the editor, before the readers of this journal.

In examining the land-agency section of the papers of this firm, I discovered a tablet in dark terra-cotta, on which was neatly drawn the plan which accompanies this article, and which was evidently appended to a lease or sale of the estate it represents. I have not as yet been able to discover the actual deed relating to this land, but I hope to do so at some future time; however, the plan itself is of great interest and value.

It represents a plot of land of about 8½ acres in area, which was situated, like all Babylonian estates, on the banks of a river or canal. The inscription at the head of the plan informs us that it is the plan of "a field in the high road on the banks of the river or canal Nahr Banituv. Although in the plan the name of the river is lost, I am fortunately able, from another tablet relating to the adjacent property, to supply this important item.

The estate is divided into three pairs of parallelograms, which I have called B^1-B^2, C^1-C^2, D^1-D^2, to which are added two more similar-shaped plots, A and E, and an irregular trapezoidal piece, F. The dimensions are all given in cubits, or fractions of cubits, and are most carefully figured on the drawing.

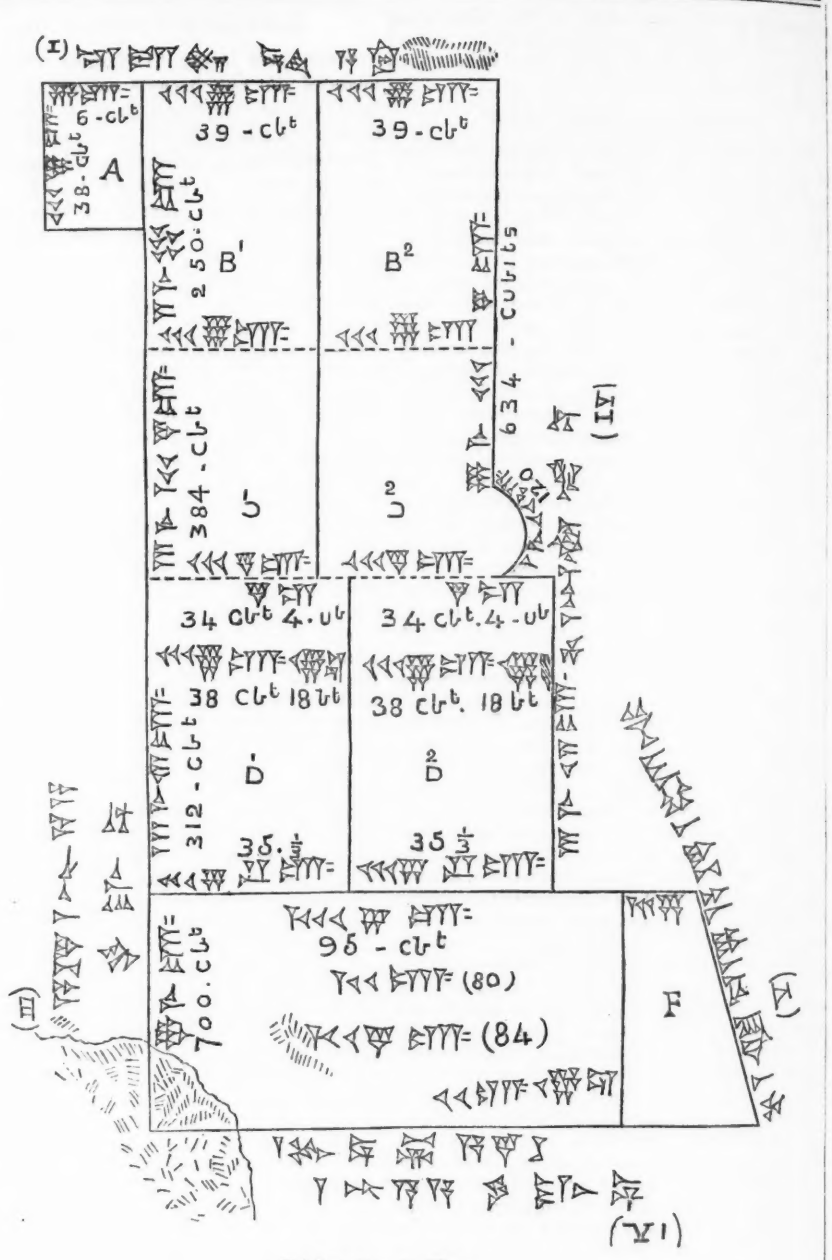
The length of the Assyrian cubit has been established by means of the comparison of the measurement in cubits of the circumference of the palace of Khorsabad, as given by Sargon, king of Assyria, in his inscription, and the measurement in mètres, as obtained by M. Flaudin, the French architect, employed on the explorations on that site.

The inscriptions state that the cubit circumference of the palace walls was 16,280 cubits, and the measurement of M. Flaudin gave 8,547 mètres, which gives a value of 0·525 m. as the length of a cubit.

Representing the French mètre as 39 English inches, we obtain for the cubit the value of 20·475 English inches. Those who are anxious to gain further information as to the linear measures of Assyria and Babylonia, will do well to consult the excellent work of the learned German Egyptologist, Dr. Lepsius, entitled "Die Assyrishen Langen masse, 1877."

The greatest length of this estate is from north to south, being 1,646 cubits, or 936 yds. 0 ft. 5 in. in English measurement. The width on the northern border, on the edge of the highway, is 84 cubits, or 140 ft. The dimensions on the southern portion being much obliterated, it is difficult to arrive at any conclusion as to the length of the base line.

The arc-shaped curve on the east side is most carefully measured, its circumference being 120 cubits, or 200 ft. It is unfortunate that the



Explanation to Plan.

I. "Field on the road which is on the bank of the river [Banituv]."
II. "The enclosure of Ipriya."
III. "[Land] of Buruga, son of Tariya, son of the chief builder."
IV. "Land of Nabu-sar-ibni."
V. "Land of Kisya, son of [Dibzir, son of Pitu-sa-babi."
VI. "Land of Buruga, son of Tariya, son of the chief builder."

The dimensions are in cubits:—Babylonian cubit = 20·475 English inches, and uban = 1/37 of a cubit.

The original plan bears no indication of being drawn to scale. The block here given is almost the exact size of the original.

small dimension in the interior of the arc is obliterated, as it evidently represented the radius of the curve.

In the names of the owners of the adjacent properties we have most important matter, for by these I have been enabled to fix the date of the plan and the name of the owner of the land, both details of great importance.

The northern boundary is the highway, another document calls it the royal-highway, on the bank of the river BANITUV. The greater portion of the western side adjoins the land or enclosure of a person named IPRIYA, and the remainder of that side, and the southern boundary is formed by the land of BURUGA, the son of Taria, the son of the chief builder. The eastern side, the whole of the upper portion, that is, Plots B^2, C^2, D^2, are adjacent to the land of NABU-SAR-IBNI. The portion F adjoins the land of KASIYA, the son of DIBZIR, the son of PITU-SAR-BABI.

Taking the cubit as 20 English inches, and the SI or *uban*, which is only the 30th part of a cubit, being omitted, I obtain the following table of areas :—

		Ft. in.	Ft. in.	Sq. ft. in.
1. Plot A =	38c × 6c =	63 3 ×	10 0 =	632 6
2. Plot B = 2	(250c × 39c) =	416 8 ×	65 0 =	54,166 8
3. Plot C = 2	(384c × 34c) =	640 0 ×	56 2 =	71,892 16
4. Plot D = 2	(312c × 35c) =	520 0 ×	57 7 =	59,886 8
5. Plot E =	700c × 95c =	1,166 2 ×	158 0 =	184,254 4
			Square feet	370,830 42
			Square yards	41,203 3 ft. 42 in.
			Acres	8. 2483 yds. 3 ft. 42 in.

8 acres 2483 yds. = 8½ acres.

Having thus roughly estimated the area of this estate, as calculated from the plan and figured dimensions drawn more than 2,000 years ago, we will now endeavour to find out some particulars of the mode of land valuation and transfer which were gone through in this case. Among the tablets of this Egibi series is one very finely written and preserved which relates to the sale of a field in which took place in "Babylon in the month TASRITOV, 14th day in the 3rd year of NABU-NAHID (Nabonidus), king of Babylon. This document is a very fine example of the conveyance series, and will enable us to gain a very full insight into the mode of transfer.

In the accompanying translation some of the technical terms are very difficult on account of their being confined solely to this class of documents.

TRANSLATION.

A.

1. A field (in area) 5 GUR, 1 AS, 5 KA of corn seed to seed it.
2. The plantations, and wells attached to the field, its borders, and approaches.
3. Upon the river (canal) of BAITUV, in the approach to the gate of ZAMAMA, in Babylon.

B.

1. 949 cubits on the upper side towards the west, a boundary is fixed.
2. By (the land of) NABU-SUM-UTSIR, the giver of the field.
3. 949 cubits on the lower side, towards the east, a boundary is fixed. By (the land of) NABU-SAR-IBNI, son of MARDUKU.
4. 40 cubits, the upper headland towards the north a boundary-line is fixed, by the king's highway, on the bank of the canal of BANITUV.
5. 40 cubits, the lower headland towards the south, a boundary-line is fixed by the other portion of the field.
6. A field for this portion, 5 measures of corn seed. A field with the wells attached.
7. And a valuation of 5 KA, 8 measures of corn seed, the area. First measurement.

C.

1. 1,630 cubits, on the upper side towards the west a boundary-line is fixed.
2. By (the land of) NABU-SUM-UTSIR, the giver of the field.
3. 1,614 cubits, on the lower side towards the east a boundary-line is fixed.
4. By the land of DIB-ZIR, the son of BEL-SUNU, son of the porter at the gate (PITU-SA-BABI).
5. For the junction of the headlands on the north the former measurement suffices.
6. And the extra boundary is fixed by the land of NABU-SAR-IBNI, the son of MARDUKU.
7. On the south a boundary is fixed by the land of NABU-SUM-UTSIR, the giver of the field.
8. An enclosure of 3 GUR, 4 KA, 7 *measures* of corn seed, the field and borders adjacent.
9. And by area measured by the KA. The second measurement.

D.

1. A field of 5 GUR, 1 AS, 5 KA of corn seed, the measurement of this field.
2. In area 3 GUR, 1 PA, 5 KA, 2 *measures* of corn seed, the fences adjacent.
3. That is at 5 measures of corn seed for 1 SHEKEL of silver, 18⅓ MANA, 8 SHEKELS of silver its value.
4. And addition 1 PA, 5 KA, 6 *measures* of corn seed for the borders and approaches.
5. That is at ½ a measure of corn seed for 1 SHEKEL of silver, ⅝ MANA, 9 shekels of silver its price.

E.

1. From NABU-SUM-UTSIR, son of NABU-KHIL-ILI, son of the chief builder.
2. MINA-ILAV-MARDUK, son of NABU-TABNI-UTSIR, son of EGIBI.
3. For the price above-named 19 MANA, 17⅝ SHEKELS of silver he has obtained.
4. In addition to its full price a 1⅓ MANA of silver as guarantee he has given it.

F.

1. The estate for 20½ MANA, 17⅝ SHEKELS of silver by this bond from the hands of MINA-ILAV-MARDUK.
2. Son of NABU-TABI-UTSUR, son of Egibi, NABU-SUM-UTSIR.
3. Son of NABU-KHIL-ILI, son of the chief builder, for the full price of this field.
4. A purchase he has made—a repudiation he has not.
5. They shall not return to each other, they shall not violate by force.
6. For the future among the brothers, the sons or the family, legitimate or illegitimate.
7. Who is of the sons of the chief builder shall repudiate these fields,
8. Not giving the silver, not reverencing this bond, silver he shall pay.
9. As much as XII full (*mana*) he shall pay.

G.

To the seal attached to this document :—
Witness in the presence of,—

1. SAMAS-SUM-UKIN, son of SULA, son of BARTUKU.
2. RIMUT, son of ZILLA, son of the chief builder.
3. MARDUK-SUM-UTSUR, son of MUSALLIM-MARDUK, son of the boatman.
4. KALBA, son of BASA, son of the cup-bearer.
5. RIMUT, son of MARDUK-IRBA, son of the soldier.
6. MARDUK-SUM-UTSUR, son of MUSALLIM-MARDUK, son of the boatman.
7. KISIR, son of MABU-UKIN-NAPISTI, son of the judge.
8. MINA-ILI-MARDUK, the scribe, son of SUKHAI.
9. NABU-SEKUL-ESIR, the scribe, son of NABUNNAI.

Babylon, month TASRITUV, 14th day, in the III year of Nabonidus (B.C. 552), king of Babylon.

℄

The nail-mark of NABU-SUM-UTSIR, the giver of the field, fixed for his seal.

●

Attached to the document are the impressions of the cylinder engraved seal of MINA-ILI-MARDUK, the scribe, who wrote one of the deeds, and the seal of NABU-SEKUL-ESIR, the scribe who wrote the other copy.

The first section of this document contains a species of preamble giving the nature of the transaction,—the land, its situation, and computed area. We find that it is situated on the border of the king's highway, in the approach to one of the great gates of Babylon. The great gate of ZAMAMA was on the southern side of Babylon, so that we may possibly recognise the Nabur Banituv, in Wurdeah Vor, one of the great canals on this side of the city.

In the second section of the deed (B) we have the measurement given of the first parallelogram into which the surveyor has divided the estate, its dimensions being 949 cubits × 40 cubits, or 1,580 ft. × 66 ft. 8 in.

Lines 7 and 8 give a computation of the area of this field, according to a system in vogue in Babylonia, and also among the Jews, by a computation of the amount of corn required to sow it (Leviticus xxvii. 16).

The third paragraph (C) relates the measurement of the second parallelogram. This parallelogram adjoins on to the southern side of the first measured portion, and its area is difficult to compute, on account of the dimensions of the headlands being lost.

A similar calculation of the area by the quality of corn required is appended to this paragraph.

In section D, two corn areas are added together, and a price estimated according to the market price of corn.

We have for the land area, the price of ⅓ SHEKEL for each measure of corn, *i.e.*, 18⅓ MANA 8 SHEKELS.

For the fences, approaches, &c., a higher quotation of ½ a SHEKEL per measure, giving us a value of ⅝ MANA, 9 SHEKELS.

Section E computes these two values, and gives us a price 19 MANA, ⅝ shekels of silver as the full price.

	Mana.	Shekels.
1. To the computed value of ground ...	18⅓	8
2. To the computed value of fences, &c.	⅝	9
	19	17
Represented in the deed as	19	17⅝
To this is added a guarantee, for faith of	1⅓	
Which, to balance the previous slight deduction is represented as	20½	17⅝

The section F relates to the ratifications of the deed and the penalties of refutation on non-fulfilment of any of the clauses. Here we notice that in the enumeration of the descendants the brothers take precedence of the sons, an evident relic of the old Turanian law of heritance which was in use in Babylonia. A similar law of heritance is in vogue in Turkey at the present day.

To the document are attached the impressions of the cylinder seals of the scribes who made the two copies of the document for the vendor of the field, NABU-SUM-UTSIR, and the purchaser, MINA-ILI-MARDUK.

The first of these scribes is MINA-ILI-MARDUK, the son of SUKHAI, and his seal is a figure of a priest, in robes of his office, standing in the attitude of adoration before an altar. On the altar are several sacred emblems, a cross, a staff surmounted by a solar disc, and a serpent. The legend on the cylinder has been written in archaic, or black letter type; the inscription, "The seal of MINA-ILI-MARDUK, the scribe." The word for seal is literally "writing-stone." The seal of NABU-SEKUL-ESIR is a figure of a eunuch in act of adoration, and bears the inscription, "The seal of NABU-SEKUL-ESIR, the scribe."

There still remains one very important point to be examined respecting this deed, and that is the enumeration of the adjacent properties; for by these we shall be able to solve the two most difficult points respecting the plan I have described.

We find the adjacent lands to the one sold in this deed are given as—

1. On the west the boundary is in the land of NABU-SUM-UTSIR, the giver of the field. This man is described in the deed as the son of NABU-KHIL-ILI, the son of the chief builder.
2. The boundary on the EAST is the land of NABU-SAR-IBNI, the son of MARDUKU. The second parallelogram adjoins the land of DIBZIR, the son of BIL-SU-NU, the son of the "man, the opener of the gate," *i.e.*, the porter.
3. The northern boundary is the "king's highway," on the bank of the river or canal of Banituv.
4. The southern boundary is the land of NABU-SUM-UTSIR, the vendor of the field.

Among these adjoining proprietors we recognise many of the names of the persons mentioned in possessing land adjacent to that figured in the plan.

In the plan, we find plots B^2, C^2, D^2, have an eastern frontier on the land of NABU-SAR-IBNI of 946 cubits, or three cubits less than that given as the length of the first plot in the tablet translated. The northern boundary is 40 cubits, or one cubit more than width of plots B^2, C^2, and D^2.

The second parallelogram joins on to the land of Dibzir, son of Bil-su-nu, son of the opener of the gate (Pitu-sa-Babi). We find the south-eastern frontier of the land in the plan, that is, the trapezoidal portion F, adjoins the land of Kisiya, son of Dibzir, son of "the opener of the gate" (Pitu-sa-babi).

From these data it is evident that the eastern boundary of the estate of the plan and that mentioned in the tablet are the same, and, in fact, the latter includes a considerable portion of the former. The estate sold by Nabu-sum-utsir to Mina-ili-marduk was a long narrow one, 40 cubits in width, and 949 + 1,630 or 2,579 cubits, in length, with a narrow headland upon the river to afford a means of irrigation of the land.

The whole western side is occupied by the land of Nabu-sum-utsir, a name which does not occur on the plan.

The south and south-western boundary of the plan are the lands of Buruga, son of Tariya, son of the chief builder. Nabu-sum-utsir, the vendor of the land in the tablet, is the son, Nabu-khil-ili, the son of the chief builder, a member of the same family, but not a son of Buruga. In the plan we find the son of Dibzir, whereas Dibzir himself occurs in the tablet; it is therefore evident that the sale of the land drawn in the tablet took place later than the third year of Nabonidus, at a time when the greater portion of this estate was in the hands of Nabu-sum-utsir, who sold plots B^2, C^2, D^2, half of E and F, and a considerable amount south of the base line, to Mina-ili-marduk for the sum of 20½ mana 17⅝ shekels of silver. Since that sale the lands had in part changed hands, and had become combined in the form of the estate figured on the plan. The probable date of this plan is, therefore, the latter end of the reign of Nabonidus.

Space will not permit me to deal with many of the points of interest which suggest themselves in the examination of these documents. I hope at some future time, when my examination of this interesting branch of cuneiform literature is more advanced, to give to this journal some more extracts from the papers of Egibi & Sons, bankers and financial agents, Babylon. W. St. C. Boscawen.

BRADFORD.

"We looked mysteriously into a kindred country, where dwelt our fathers; inexpressibly dear to us, but which had seemed for ever hidden from our eyes,"—words of Carlyle, which might fittingly be used by those who know Bradford now, and could have looked upon a faithful portraiture of it as it was when the element of growth began really to manifest itself. To obtain such a portraiture we must look to what Bradford was between forty and fifty years ago. We need not cast back anxious eyes into the past; for, except in the dating back of the old parish church to the reign of Henry VI., there is not much of an antiquarian nature about the town, and what there is is so girt about by the genius of to-day,—the erections, the factories, and the noise,—that it is hidden. The town is in the heart of the manufacturing country; situated at the junctions of what were "three beautiful valleys." With coal and iron abounding near it, and with facilities of shipment by its canals and of despatch by early railways, it necessarily acquired greatness. Let us look at what it was above two score years ago, and we shall speedily see what changes it has known since. It had been, under the great Reform Act, recently created a borough; it was building a large new courthouse, where we were to meet its "court of requests," and that for the "honour of Pontefract"; it had two churches,—St. Peter's and Christ's,—besides half a dozen chapels and places of worship for Dissenters; its markets and fairs were to some extent agricultural; its manufactures were then, firstly, worsted stuffs, then broad and narrow cloths, and "wool cards and combs" were also made. The gentry of that day lived in High-street, Manor-row, Vicar-lane, and Horton-row; four bankers—including firms still trusted—kept the cash of its merchants; there were boat-builders on Canal-side and Windhill; the sole collieries worked near were Bowling, Four Lane End, Wilsey, Calbery, and Eastbrook; shuttle and sizing makers abounded; sixty-eight firms were included in the list of woollen cloth manufacturers, including representatives of the Bradley, Dibbs, Hammond, Hardaker, Lightfoot, Overend, Parker, and the Wall families; whilst the woolstaplers were even more numerous, and the worsted spinners and worsted-stuff manufacturers formed an imposing number. The gasworks in Mill-street were small. A dozen coaches ran to Halifax, Huddersfield, Kendal, Leeds, Manchester, Preston, Skipton, and York; a van to London, whilst the Deacon & Harrisons, the Carvers, Thompsons, Huttons, and Harrisons, formed the chief of the carriers, and Selby Canal and other companies gave "conveyance by water." The post-office was on a small scale—in Kirkgate,—and from Keighley and Haworth it was still by horse-post. Finally, at the first election the candidate at the head of the poll received only 634 votes, although the borough contained even then 43,537 inhabitants.

After the date to which these particulars refer, there was the commencement of an era of growth in the great trades of Bradford, and a necessary growth of the town itself. The position of the town, its full supplies of power, the variety of its trades, and the extent to which there has been a growth in the wants the chief of these supply, are the main causes to which that growth may be ascribed. It has been, on the whole, a steady and sure growth, not so much by leaps and bounds, as has been known in the case of other communities, and possibly for this cause it has not so fully known the eras of special depression that other towns have known. It still has its ironworks, on, perhaps, a scale of increased size; it has stone-works of some note; its collieries have shared in the prosperity and adversity of the coal trade; but still, its chief dependence is on its wool and worsted manufactures, and it may claim to be the principal seat of the stuff and woollen yarn trades; and the growth of these varied trades has been reflected in the population and in all the tokens of an enlarged populace. At the last census the numbers of the people had so risen that from the 43,000 we have noted they had to be set down as 145,830. Its School Board, before it had been many years in existence, had 7,300 children on the registers of its schools, and has largely increased its accommodation since. The number of paupers in the limits of the local Board of Guardians varies between 1,000 and 2,000; in the town the death-rate fluctuates between twenty and thirty, and the number of deaths from sixty to nearly 100 weekly. In the Bradford Infirmary and Dispensary there are usually about 100 in-patients, whilst those treated outside raise the number of the afflicted dealt with by this institution over 1,000 weekly, and other institutions play their part in the removal or the assuaging of the pains and ills the flesh is heir to. There are more pleasant proofs of the great and growing population of Bradford; there are the almost countless churches and chapels which stud the town with edifices of differential beauty; the noble provision that has been made in the handsome parks for the recreation of the populace; and the manner in which some attempt has been made to meet the intellectual needs of the townspeople. Not only so, but in its mechanics' hall, its free library, its temperance-hall, which has been said to be the first of its kind in the world, and one or two of its hospitals, it has buildings with considerable claims to architectural beauty. Its stations are in one or two instances being made more commodious; it boasts of three or four statues, including those of Titus Salt and Oastler; and in other modes it has shown a corporate appreciation of art not universal in English communities. It is true that this taste has been exhibited under considerable difficulties, under the general difficulties which affect such communities in the smoke and the soot of busy manufacturing districts, but that it exists in spite of these is matter for congratulation.

As to the trade of Bradford and the prospects of the town, its predominance in the special industry which has taken such deep root in it is well known; and its market is looked forward to with eagerness wherever men in the wool and worsted trades most do congregate. Its banks are many, and the appreciation by capitalists of the chief of these may be gathered from the fact that the shares sell for three times the amount which has been paid up. Similarly its Exchange and others of its public buildings have their values "above par," and its Corporation and Canal Company have their respective securities also approved by capital. The foundations of its trade are secure, and it is more likely that that trade will be increased by the addition of new branches than that it will be diminished by the falling off in the old. In its position, its old and continued repute, as well as in the largeness of the capital invested in its chief trades, there are very substantial reasons why Bradford may expect to flourish and to increase. It is not the small town it was half a century ago; but it has put forth new roots which seem to have taken enduring hold. Stretching not only out itself, it has put forth offshoots around it which are not the least part of its greatness. In pleasant Airedaile, one of its best known sons planted a vigorous young manufacturing colony which could not find room for its growth in Bradford, and created a model manufacturing village known far and wide. And though Saltaire may be said to be the chief of these offshoots there are others notable in their way around Bradford, whilst all the villages near the town have derived a vast impulse from the growth of that great community, and in most instances that impulse has been of an industrial order. Thus, with its belt of manufacturing towns in embryo, with a district around it studded with great communities, and with ample railway communication with all the great centres of trade and population, Bradford may claim to be one of the most promising commercial towns in Yorkshire. As we have seen, it has within it one or two oases in the midst of a wilderness of brick and mortar, and it has also an outlet by rail to one of the most bracing and invigorating, not to say one of the wildest districts of England. Stretching right out from Bradford, there runs out by Skipton the great extension of the Midland Railway, which in its northern course rushes, careering through a wild land, where mountain ridges and high and bleak moorlands alternate with pretty little dells far below, looking down on which the gazer is reminded of those lotus-eaters who looked down from the heights on the tillers of the soil below. The great seat of the stuff and woollen yarn trades has, then, ample opportunity to seek rest in the breezy uplands far away from its own noise and dense life. It has in the parks that beautify it, and in some of its many public buildings, proofs of the public spirit of its citizens, which will serve it in good stead in the future as in the past. Its trade must know the ebbs and flows in that greater volume of trade of which it forms a part; but unlike stationary communities, it flows with the flow, and it does not feel so fully the ebb as do some, and thus its future is promising as its past has shown fulfilment.

A MIDSUMMER NIGHT'S DREAM IN MARBLE.

The great vase which M. Gustave Doré has executed for the Exhibition of 1878 at Paris, is the most original design which can be found in modern sculpture. We call the object a vase, in default of a better word; but it does not belong to either of the nine principal forms of vase, as they are indicated in the Catalogue of the British Museum. It is neither an amphora, a hydria, a krater, a lebes, a lekythos, an ariballos, a cantharos, nor a kylix. It does not approach the more modern form, dear to the artists of the Renaissance, of the tazza. An Italian would call it bluntly *una bottiglia*. It is a pear-shaped, long-necked vessel, of very elegant proportions and curvatures, standing, with the pedestal, which forms part of the design, 4·50 mètres high. The extreme width is about half the height. The diameter of the narrowest part of the neck is one-fifth of the widest diameter. Over, under, round, and into the mouth of this gigantic vessel, a chorus of some hundred satyrs, nymphs, and *amorini* are conducting a midsummer night's revel. The extraordinary boldness of the work may be estimated, rather than imagined, when we say that the largest figures would stand, if erect, 3 ft. high; and that the whole group consists rather of figures in the round than of what is usually called relief,—even *alto relievo*. The motive of the grouping may be said to be the capturing and binding of the Satyrs by the Nymphs and Loves; but the boldest and most life-like notions startle the observers. One lovely little cherub has twined a vine-stem round the legs of a Satyr, who is struggling with four other Cupids and a nymph, and has fallen backwards with the force of the pull, and rests on the ground only with one knee and one foot, —the little body being at right angles with the vase, and the head actually upside down. The

face of the latter figure has an arch and triumphal smile, while his companion, whose vine-stem has snapped, is falling below him, with a lively expression of terror and wrath at his mishap. On the opposite side of the vase a sort of Cupid's ladder is occupied with girls and Loves climbing to the summit. One little Amorino is squeezing grapes into a cylix held by a nymph, who must be thought,—perhaps alone of all the numerous figures,—to be already somewhat the worse for the vine-juice. Behind him a girl helps herself up by clinging to the ankle of a climbing Cupid.

Yet higher another Love has just got his arm over the lip of the vessel; while a third, perched on the top, holds up his right hand in encouragement. A fat Silenus, to the right of the wine-making Cupid, seems oppressed with heat or with thirst, and is tended and embraced by two boy-angels. Again, looking to the right, we come on a Cupid riding on a lizard, and just unhorsed by the wriggling opposition of his *monture*. The little winged groom, whose duty it is to lead the lizard, is almost entirely detached from the vase. A Satyr, blowing a conch, and holding on with one hand to the vine-tracery, is another figure almost wholly detached from the ground. One seated female figure, with a Cupid seated by her, may be considered, from the comparatively matronly quiet of her attitude, to be Venus, or Titania, or the *chaperon* of the wilder girls. Around the base of the vase are Cupids engaged in more serious business, such as was indicated by the charge of Titania,—

"Come, now a roundel and a fairy song;
Then, for the third part of a minute, hence:
Some, to kill cankers in the musk-rose buds;
Some, war with rear-mice for their leathern wings
To make my small elves coats; and some, keep back
The clamorous owl, that nightly hoots, and wonders
At our quaint spirits."

Spiders, beetles, worms, moths, and flies, instead of bats and owls, are the small deer chased by the elves of Doré, one of whom is engaged in the unprecedented frolic of blowing a snail, as a schoolboy blows an egg, with his lips at the end of the spire of the shell, the mollusc turning round his horned eyes in embarrassment.

As an example of the picturesque in sculpture, and the execution, in solid material, of the lightest and wildest sketches, hitherto confined to the pencil or the etching-needle for their production, M. Doré's vase stands alone.

SOUTH KENSINGTON PRIZE DRAWINGS.

The drawings to which prizes have been awarded in "the National Art Competition of 1878" are on view in Exhibition-road. They are very numerous, about 1,400 in number, and fill two pretty large rooms on walls and screens, and furnish, we may conclude, a good indication of the nature and extent of the work which is being done under the anspices of "the Department." At least, as to the extent of the work done we must form a high estimate, because we learn that these are selected from 138,045 works sent up by 142 schools of art throughout the kingdom. Nevertheless, the impression produced, on a first view at any rate, is that medals are given rather freely, and are not very difficult to earn. If we may conclude that a comparatively sufficient discrimination is exercised in dispensing rewards, we must also conclude that in that case an immense amount of poor work is submitted. Of course, it may be said that this is to be expected when the competition is open to all pupils in a certain grade of the Government schools of art all over the kingdom. There are nine gold medals given, nearly forty silver ditto, between seventy and eighty bronze ditto, and considerably over one hundred book prizes; all alike dignified, we observe, with the title "National," — "National Gold Medal," "National Bronze Medal," "National Book Prize"; so that we are surprised, in the case of drawings honourably mentioned, not to find them also labelled "National honourable mention." There is a degree of pomposity about this which is unnecessary, and which, in view of the character of some of the works on which these national rewards are bestowed, becomes occasionally rather ludicrous. For example, we observed that a National gold medal for architectural design (the only one awarded) had been gained by a student at Northampton, for a "design for church." This we naturally looked at with some interest; and, having certainly some special right to speak in regard to architectural design, we must plainly say that to give a reward with so high-sounding a title for such a drawing as the one in question is simply absurd. It is a perspective drawing of a Gothic church, without a spark of originality, and so scratchy and defective in drawing in many places that it could hardly have had a chance for a prize even in the *junior* class of design of the Architectural Association. The architectural contingent to the exhibition is not large; there are, in fact, only a very few architectural drawings hung; but, even granting that this were the best of them, to give the producer of this drawing the right to say that he obtained a "National Gold Medal" for architectural design is not a proceeding calculated to raise the Government schools of art in the eyes of architects, to say the least of it. In fact, however, the architectural design by Mr. Marshall (also a Nottingham student), to which the bronze medal has been awarded, has considerably more merit in it than one that gained the "gold," as it shows a certain amount of originality in architectural treatment, which the other certainly does not. Other gold medal designs seem (as we heard remarked in the room) "very easily earned"; one for designs for glass vases, for example, of which the drawings are fairly executed, but the designs contain nothing more than might be picked out of any one of half a dozen shop-windows. In other cases there is a more even balance between the work and the award; Miss Bradley, of Dublin, for example, has gained the gold medal for "a chalk drawing of a head from life" by a drawing showing much feeling and refinement, and not over-finished; and Miss Grace (Brighton) shows a still-life group in oil which quite deserves the honour it has attained,—an honour, however, considerably impaired by the bestowal of a medal of precisely similar importance on works exhibiting very inferior qualities.

We commended one drawing as not being "over-finished," thereby intending to imply our conviction that in certain departments there is a good deal more attention paid to finish of execution than is consistent with the real end of the kind of study pursued. Of course, if people paint flowers, for example, or anything else from life, it is hardly possible to finish too much, because the finish, the realisation of the delicacy of nature, is itself the object, and the work when complete is really a work of art and a thing to derive pleasure from, though ostensibly done as a study. But we can hardly feel the same in regard to the drawings from well-known casts which fill so large a part of the wall-space, and upon which so much time and labour must have been bestowed. A crayon drawing from a cast is a means to an end only,—a process of learning; and, in our opinion, the student who spent a given time in making two or three drawings of the object from different positions, with accuracy but not with much finish, would know much more about it, and have made more progress in drawing within the time than the one who devoted the whole time to a highly-finished stippled-up drawing from one point of view. No one cares for the latter when it is done; and the only aim in this stage of study should be to get as much power of drawing as possible in proportion to the time expended.

Things are not so bad in this way at South Kensington, perhaps, as they once were. We do not now see rows of drawings of a plaster plum or something else equally uninteresting, which have as much relation to real "art" as practising scales has to real music. But the impression produced by the collection is that the hand rather than the head is educated in the Schools of the Department. From a certain point of view it may perhaps be replied that this is all that a school of art can really profess to accomplish, and that the pupils themselves must bring the brains and the feeling to bear upon what they learn, and turn it to its best account. Still, there is a very obviously prosaic tendency pervading the studies. In the oil studies still-life immensely predominates; groups of jars and books and other objects of the kind. Landscape is scarcely represented at all, leaving us to suppose that it is not much encouraged; and what there is of it is mechanical and destitute of feeling. On the whole the decorative design seems to us the most successful department, though here we quite fail in some instances to understand the judgment which has regulated the distribution of rewards. The occasional specimens in which originality and artistic power rather than mere finish, are exhibited, serve to render the mechanical nature of the mass of the work more prominent; but these do not seem to have found the favour they might have reasonably expected. Miss West's very clever little sketch of two mice attacking a piece of cheese, which gets a bronze medal only, shows much more real artistic insight and observation than some things which have received medals in more precious metals. There are one or two figure studies from the life from Lambeth, drawings and models, which have far more of life in them than those which have received prizes over their heads. In short, the impression produced is that the prizes are given more for manipulation than for any higher quality; and we cannot consider this a good or desirable tendency in a school of art.

INTERNATIONAL CONGRESS ON CIVIL ENGINEERING.

The programme of the International Congress on Civil Engineering at Paris, in 1878, is of importance not only as a guide to inquiry and discussion, but as a synoptic view of that branch of practical science as regarded in France. It consists of nine sections, which are as follow:—

Section I.—Mines and Metallurgy.

1. *Steel.*—New modes of making steel; its economical future; its various applications. 2. *Explosions of Firedamp.*—Explosions; causes to which they may be attributed, and more particularly their relation to the varieties of atmospheric pressure; influence of ventilation; preservative methods. 3. *Transport in Working Mines.*—Interior transport; elevation to daylight; horizontal and inclined traction by chains; discharge; embarcation. 4. *Mechanical Working of Coal.*—Procedures proposed; air and water employed as means of transmitting power; attempts at application; future reserved for the subject. 5. *Processes of Sinking.*—Means employed; present state of the machinery; dimensions of the largest bore-holes; boreing for mineral research; extraction of specimens; sounding with reference to springs of water; latest works on artesian wells.

Section 2.—Agriculture and Rural Engineering.

1. *Steam Culture.* — Present state of the question; machinery; means to be employed in order to hasten the development. 2. *Utilising Hydraulic Resources.*—Present state of irrigation; study of the means of increasing its extent; natural irrigation; machinery to employ; reservoirs; dams. 3. *Reclamation of Land fit for Cultivation.*—Drainage; embankments; polders; encouragement of enterprise. 4. *Machines serviceable for Harvesting.*—Mowing-machines; reaping-machines; haymaking-machines, and rakes; their application in France; conditions which they must fulfil; their present state. 5. *Economical Transport in Farms.*—Traction-engines; conditions of their employment; results obtained in England; agricultural railways; material for transport.

Section 3.—Machines.

1. *Steam-power.*—Its valuation by land and by sea; indicated horse-power, nominal and effective; specification of the power of boilers; unification of steam horse-power. 2. *Accumulators.*—Extension of the employment of accumulators, and of machines of hydraulic pressure; motor machinery; hydraulic presses; hydraulic tools; transmitters of power. 3. *Associations for Supervision of Steam-Engines.*—Their development; statistics of accidents; influence of the associations on the prevention of accidents; on the economy of fuel; their importance with reference to the observation of rules; testing of iron plates. 4. *Unification of the Dimensions of the Parts of Machines.*—Pitches and diameters of screws and bolts; state of the question in France, in England, and in Germany; commercial importance of unification; system to adopt. 5. *Choice of the Fittest Metals to adopt for the different Parts of Machines.*—Properties of mild steels, and of hard steels; properties of cemented iron; properties of malleable cast-iron; conditions of employment; boilers on steel plates; shipbuilding in steel.

Section 4.—Roads, Rivers, and Canals.

1. *Inundations: Means of Checking them.*—Natural basins,—basins of retention; embankments; plantations; methodical study of floods; their prevision; probable indication of their height. 2. *New Descriptions of Metal Bridges.*—The new methods compared to the old; tempo-

rary bridges; modes of support and of movement; description of the best examples. 3. *Utilisation of Roads and Banks for the Establishment of Railways.*—Edge rails; flanged rails; influence of the form of rail on the kind of way; augmentation of adhesion; diminution of traction. 4. *Comparison of the Different Modes of Paving Towns.*—Pavements; macadam; wood; flags; bitumen; examination of the different systems with reference to cleanliness, cost of maintenance, and traction; inquiry made in England. 5. *Dams for Rivers.*—Different systems of movable dams; their mode of construction; their cost; their efficiency; description of the latest examples.

Section 5.—Railways.

1. *Economical Railways.*—Gauges, gradients, curves; junctions, change of vehicles; results obtained. 2. *Motor Machines for Tramways.*—Motors by steam, hot water, and compressed air; automotor machines, towing machines; coefficients of traction. 3. *Material Improvements to Introduce into the Passenger Service.*—Carriages; warming them; sleeping-cars; communication between the vehicles; goods traffic. 4. *Perfecting the Way.* Substitution of steel for iron rails; metallic sleepers; changes of way. 5. *Employment of Steep Gradients.*—Central rail; fixed engines; funicular systems; principal results obtained; steam brake.

Section 6.—Navigation, Fluvial and Maritime.

1. *Compound Engines in Marine Navigation.*—Their advantages; their systems of distribution; consequence of their employment; surface condensers; deteriorations resulting from the employment of the water of condensation. 2. *Resistance of Hulls.*—Successive changes of sections; recent observations; rules deducible; limits of recoil. 3. *Haulage of Boats.*—Direct towing; submerged chains; towing from banks, by cattle or by locomotive engines; resistance to traction, according to speed, and according to the sections of canals. *Life-boats.*—Conditions to fulfil; latest improvement; development and organisation of humane societies; porte-cords and other means of communication. 5. *Rolling and Pitching.*—Apparatus of observation and registration; experiments on rolling and pitching; relation between the form of hull and different conditions of the sea; means proposed to check rolling.

Section 7.—Public and Private Constructions.

1. *Supply and Distribution of Water in Towns.*—Quantity of water necessary; its choice; river water; filtration; establishment of hydraulic apparatus; spring water; aqueducts and reservoirs; their construction; conduits of distribution. 2. *Drains.*—Their use; their modes of construction; their cleansing; employment of water from drains in agriculture. 3. *Ventilation of Edifices.*—Different conditions of the problem; ventilation by pressure or by exhaustion; by chimneys or by machines; quantity of air necessary; connexion between warming and ventilation; examples of recent apparatus. 4. *Mechanical Perforation of Galleries and Tunnels.*—Percussion perforators; results obtained; rotary perforators; examples of their application; utilisation of natural forces; cost per mètre forward. 5. *Foundations of Great Works.*—Foundations in rivers and in the sea; employment of compressed air; influence of pressure on the health of workmen; means to obviate evil results.

Section 8.—Industrial Physics and Chemistry.

1. *Utilisation of Artificial Cold.*—Industrial production of cold; its distribution by liquids or by gas; different methods in use; principal application; cold in chemical industries; preservation and management of food. 2. *Lighting large Workshops.*—Industrial production of electric light; work involved; utilisation for the lighting great vessels; economical results in workshops; divisibility of electric light. 3. *Pneumatic Telegraphs.*—Particular conditions under which they are applicable; description of apparatus; examples taken from great organised systems. 4. *Industrial Employment of Explosive Substances.*—Dynamite compared to other explosives; precautions necessary to take in the manufacture; transport and storing of explosives; their application to the execution of great public works; economic results. 5. *Gas Stoves.*—Principles of their mode of action; their application in metallurgy; in gas making; in glass and pottery furnaces; in the production of steam; analysis of combustible gas; established economical results.

Section 9.—Different Industries.

1. *Machines for Domestic Use.*—Sewing-machines; their influence on the clothing industry; their economic results; motors applicable to sewing-machines; knitting-machines; embroidery-machines. 2. *Fabrication of Paper, from the point of view of the Paucity of Rags.*—Straw and wood; increasing proportions of their introduction; different substitutes for rags; manufacture of pulp; transport of pulp; present condition of the manufacture of paper. 3. *Recent Progress of Spinning and Weaving.*—Different trades concerned in spinning; development of this industry in the United States; factories for mechanical weaving; automatic stopping of the machines in case of the rupture or tangle of a thread. 4. *Cements, their Manufacture and Use.*—Portland cement compared to other products of new kinds; resistance of cements in hydraulic constructions; blocks of cement for use in the sea; comparative trials of cements; present state of the industry. 5. *Character of Textile Fabrics.*—Conditions which new textile matters must fulfil to be applicable to the manufacture of tissues; jute; *formium tenax;* properties of their fibres; increasing importance of their use; character of the tissues which they form; relation between this problem and that of the materials requisite for making paper.

CRYSTAL PALACE ENGINEERING SCHOOL.

This useful institution, which opened in January, 1873, with nine students, continues its successful and prosperous career. The seventeenth term of the school came to a close on Saturday last, by an inspection of the work of the students in the drawing-office, the pattern-shop, the smiths' shop, the fitting-shop, and in the workshop of the Colonial Section, all situated in, or at the base of, the south tower of the Palace; also a bridge erected by the "Colonials" across an arm of the lake at the lowest part of the grounds, between the shore and the Tertiary Island, upon which the students have been camping out for several weeks past. The certificates awarded to the successful students were afterwards presented to them by General Henry Hyde, R.E., of the India Office, Assoc. of Council In.C.E.

Mr. H. S. Bicknell, deputy-chairman of the Crystal Palace Company, introduced General Hyde in a few appropriate remarks, in which, in the name of the directors, he had to express to the most eminent members of the engineering profession, Royal, Civil, and Mechanical, their most earnest thanks for the countenance and assistance that these gentlemen had given so readily, at a considerable expenditure of time and convenience, to the interests of their engineering school.

General Hyde, before presenting the certificates, stated that an engineering experience in India, extending over many years, and a wide range, and a narrow examination of the work that had been done by the students in all the sections, enabled him to say that they had in this school an institution much needed, and of peculiar value. Young men who intended to follow the engineering profession in India, in the colonies, or anywhere abroad, had here the means of acquiring theoretical knowledge, but especially practical, handicraft capability, that they would not find abroad. They must go from home trained, and capable from their training to utilise their resources, under new conditions, and hitherto untried difficulties. The General gave the students some valuable practical advice, and pronounced the school the supply of a great necessity, and for them a field of opporounity that they could not overappreciate.

The examiners were Mr. Ernest Benedict, M.I.C.E., and Mr. J. W. Grover, M.I.C.E., whose report was read by Mr. F. K. J. Shenton, secretary. Sixty certificates were awarded, but twelve of the students took two each, one for lecture examination, and another in some other section, making forty-eight students, out of the total of sixty-three, certificated. The lectures for the term were on "Railways: their Construction and Appliances." The result of the examination was less satisfactory under this head than it has been at the close of former terms, possibly from the number of marks attainable,—242,—having been raised. In December, 1877, there were eighteen certificates awarded for lecture examination: on Saturday the case stood thus,—students who had attended the lectures, thirty-five; eligible for examination, twenty-seven; passed satisfactorily, twelve. Mr. P. J. Ogle was first with 228 marks, Mr. R. L. McLaren second, and Mr. F. Mackinlay third. Each of these three students had also certificates for work in the fitting-shop. Twelve certificates were awarded for work in the drawing-office,—Messrs. A. T. Anderson, first; E. Allen and G. N. Taylor, equal seconds; and T. Cargill, third. In the pattern-shop twelve students were certificated,—Messrs. A. C. Pickthall, first; W. Halfhide and W. N. Woods, equal seconds; and A. A. Barnes, third. In the fitting-shop ten certificates were awarded,—Messrs. M. F. Wilson and H. Denny first and second respectively. For the first term in the civil engineering section,—general surveying and preparation of plans, sections, and estimates for Parliament,—seven certificates were awarded,—first, Mr. F. J. Scott; second, Mr. W. Hewitt; third, Mr. B. B. Bridges. Second term,—calculation of strains, and preparation of general and working plans, specifications, and estimates of a railway and dock,—five certificates, Messrs. W. A. Fenton, first; E. Hott and C. W. Moore, equal seconds. Two students in a third term of the civil engineering section, Mr. G. S. Aitken and Mr. D. Gibson were first and second respectively.

Mr. Benedict, apologising for the unavoidable absence of his colleague, Mr. Grover, said that in their *viva voce* examinations they had endeavoured not only to get correct answers, but to find out whether the students thoroughly understood what they were talking about. After twenty-five years' experience in India and in England as a working civil engineer, he was prepared to say that no man who made a toil of his daily work could possibly get on. A man to make his mark in any profession must love his work for its own sake; this applied, indeed, not only to professions but to handicrafts, and if we heard a little less about a "fair day's wage for a fair day's work," and a little more about the quality or value of the work done or turned out, we should have less difficulty, he felt sure, in keeping our place at the head of nations. With the present open competition in England, which was close run by foreign engineers, it was now more than ever necessary for Englishmen to strain every nerve to keep their ground, and every young man who did not feel his heart and soul in his work should give it up at once, and turn his attention to something else: he would certainly do little good as an engineer. In this school a young man had exceptional advantages for preparing himself for an after-career, and it would be his own fault if he did not take advantage of them. He could here learn in a few months, with little trouble, what in practice it might take him years to pick up. He would impress upon young engineers that theirs is an honourable profession and not a trade, and, that like Cæsar's wife, they should be "above suspicion," so that they may be as much trusted by their employers as by those they employ, as lawyers, doctors, and clergymen.

The examiners in their joint report state that although the standard of examination is very high, the results of the lecture examination have been most satisfactory, and that the notebooks of the students show how highly they value the instruction imparted to them.

Mr. Wilson, the principal, in reply to a vote of thanks, delivered briefly an address, touching upon the honourable positions that had already been achieved by former students in the school. He spoke in terms of high commendation of the conduct of their last *primus*, Mr. F. J. Scott, who was now leaving them to enter upon a good appointment. He was first, in his time, for lecture examination, had done equally well in every section, and now left them first in the Civil Engineering section in which he had been studying during the last term.

Arbitrator under Dwellings Improvement Act.—At a meeting of the Metropolitan Board of Works last week, a letter was received from the Home Office, stating that the Home Secretary has appointed Sir Henry Hunt, C.B., to act as arbitrator in the matters of the schemes under the Artisans', &c., Dwellings Improvement Act, 1875, for the improvement of certain areas within the Westminster District and the parish of St. Giles-in-the-Fields.

NEW SUBWAY AT VICTORIA STATION, PIMLICO.

We last week had an opportunity of inspecting the new subway opened at Victoria Station on Monday. The subway, as we have already mentioned, connects the Victoria Station of the Metropolitan District (Underground) Railway with the Victoria termini of the London, Brighton, and South Coast, and the London, Chatham, and Dover Railways, and will thus facilitate the transit of passengers between those stations. Hitherto passengers from either of the termini mentioned have had to incur the danger and inconvenience of crossing the station-yard, which is generally very crowded with vehicular traffic, and is, moreover, very dirtily kept. Hence the new subway will be a great boon. The subway consists of a main passage running in a straight line for a length of 300 ft., 10 ft. 6 in. wide, and 9 ft. 6 in. high to the crown of the arch, which has a versed sine of 2 ft. This passage has its sides and roof faced with white glazed or enamelled bricks, supplied by Mr. Barfield, the London agent of the Farnley Iron Company. The floor is paved with Val de Travers asphalte, 1 in. thick, laid on a bed of concrete, 2 ft. thick. Channels are formed at each side to carry off any water that may enter. The whole of the brickwork is set in Portland cement. The arch is four rings of brick in thickness, the side walls being 3 ft. thick, and carried down to a depth of 20 ft., and supported on concrete foundations. The subway is constructed through what was once part of the Grosvenor canal dock or basin, and a number of old piles were met with. The subway is lighted and ventilated at about the centre of the 300 ft. length referred to by means of a sort of lantern light opening into the centre of the station-yard, and forming a crossing "refuge" for foot-passengers, much in the same style as the subway leading from the Westminster Station to the House of Commons is lighted and ventilated. An iron framework, 9 ft. long and 6 ft. wide, fitted with Hayward's patent semi-prismatic lights, is supported on iron joists to form the footpath of the "refuge" in question, and at this point in the subway the side walls are carried upwards with a raking batter, terminating in a semicircular opening on each side. These openings are faced with white bricks, and are surrounded with a cast-iron railing through which air enters the subway, being glazed on top with thick rough plate glass. Having now described the main portion of the subway, it only remains to state the mode in which it is connected with the various stations. At the District Railway end, the subway widens out into a sort of bellmouth, whence proceed, right and left, passages leading respectively to the up and down platforms of the District Railway, that leading to the up-platform being continued across the line by one of the pre-existing bridges. The construction of these passages is substantially the same as that of the main subway. In addition to these side-passages leading to and from the up and down platforms of the District Railway, there is a third entrance in the centre, at the end of the main subway, this entrance leading directly into the booking-office of the District line, which is only three or four steps above the level of the subway. At the other end of the main trunk of the subway, going from the District station, are the communications with the London, Brighton, and South Coast and the London, Chatham, and Dover Railway. The approach to the Brighton Company's station is up a flight of Portland stone steps on the right-hand, running at right angles to the subway, and giving access to the exterior of the booking-offices of the Brighton line, though under the projecting glazed carriage shelter. The approach to the London, Chatham, and Dover Railway Company's terminus is by a passage 33 ft. in length running diagonally from the left-hand side of the main subway, opposite to the stairs giving access to the Brighton line. At the end of this short passage is a flight of Portland stone steps, giving access direct into the interior of the Chatham and Dover Company's terminus, just by the Customs' shed. This short arm or passage was constructed at the sole expense of the London, Chatham, and Dover Company, under whose premises it is carried; but the other portions of the subway were constructed at the joint expense of the three companies. The total cost of the works (which have involved the diversion of two sewers) is between 4,000*l.* and 5,000*l.* The whole of the works have been carried out for the companies by Mr. Charles Dickinson, contractor, under the superintendence of and from plans prepared by Mr. Henry Wallis, C.E., of Westminster. The iron railings surrounding the steps leading to the Brighton Station, the gates shutting off communication between the subway and the various stations when traffic has ceased (or to prevent undue crushing and crowding), have been provided by Messrs. Young, of Pimlico; the gasfittings by Mr. Z. D. Berry, of Westminster; and the prismatic lights by Messrs. Hayward Brothers. Mr. Swaker has been the contractor's foreman in charge of the works. Altogether, the work is very creditable to all concerned, and the only wonder is that so necessary an improvement was not effected years ago. The railway companies are sure to reap their reward, for passengers will now be able to pass safely and speedily, and without being bespattered with mud, from the low-level lines running east and west to the high-level lines running south of the metropolis.

COMPLETION OF THE METROPOLITAN MEAT AND POULTRY MARKET.

With the erection of that portion of the Poultry Market on the south-west side, bounded by the Metropolitan Railway and King-street, Snow-hill, the Metropolitan Meat and Poultry Market may now be said to be completed. This section of the market is now finished, and will be occupied and thrown open to the public in a few days, as soon as the paving of the King-street, Snow-hill approach, now in progress, is completed. By the taking down of several houses on the north-west side of King-street in order to give a spacious carriage access to the market at this point, a considerable additional street area has been gained, the width of the thoroughfare in front of the market, at the angle of Snow-hill and King-street, being about 80 ft., and forming a sort of open square. By this approach the market will now be easily reached from the neighbourhood of Newgate-street and other main thoroughfares on the south side, as well as from Charterhouse-street on the north side. The section just finished has two spacious entrances, and includes the whole of the south-east elevation of the Poultry Market, with the exception of the tower at the east angle. The tower just completed at the extreme south-west angle of the building is uniform with that at the east, just named. The two markets, with the thoroughfares intersecting them, cover an aggregate ground area of nearly six acres. The extreme length is about 1,000 ft., and the width upwards of 200 ft.

NEW BUILDINGS, BERLIN.

THE OFFICE OF THE INSPECTOR-GENERAL OF ENGINEERS AND FORTIFICATIONS.

We have been enabled on frequent occasions to refer to the progress of architecture in Berlin, and to the perseverance displayed and attention bestowed, both by public and private enterprise, in beautifying the aspect of the city on the Spree.* In this number we present our readers with the illustration of another of the fine buildings of which the capital of the Hohenzollerns can boast.

A handsome quarter, the West End of Berlin, has been rising during the last ten years in a locality formerly known as "Schafgraben" (Sheep's Ditch), on the road leading at the southern side of the Thiergarten, past the Zoological Gardens, to Charlottenburg. It is an ever-changing scene, as we pass along, of villas embowered in pretty gardens alternating with mansion-like structures. Both the "speculating builder,"—if the term may be employed in this particular instance,—and owners of property have done their duty. It almost seems as if they had struggled in earnest in a competition in which good taste and elegance were to carry off the prize. The façades of the new buildings have been adorned most lavishly, so that this part of Berlin may now indeed be looked upon as the handsomest quarter of the city, completely overshadowing, by the beauty of its architecture, the older streets of the whilom Prussian capital.

The building illustrated rises in the centre of this aristocratic and, architecturally speaking, fastidious neighbourhood, its style and high cupola creating an effect far and wide; the emblems and decorations placed over the windows and the portal indicating the purpose to which it is devoted.

The front of the building serving as offices for the Inspector-General of Engineers and Fortifications is placed on the north side of the Kurfürstenstrasse. Its style reminds us of the architecture of the times of Frederick the Great; but we find also in its minor features imitations of the decorations of the Berlin Arsenal, making its architecture a near approach to the rococo style, without, however, the degeneracy and fantastical bizarreness of the French treatment. The façade is richly membered; the centre part, surmounted by an elliptic cupola, jutting out powerfully into the foreground. The corner pavilions also are somewhat advanced, and provided with steep mansard roofs and small turrets.

The ground-story is rusticated, faced with yellow cement. Over the windows we discover, cast in gypsum, the celebrated masks of dying warriors by Schlüter in the court of the Berlin Arsenal. Corinthian pilasters of yellow cement support a richly-membered entablature; the walls between the pilasters are of red brick. The centre pavilion is characterised by two large caryatides, old Teutonic warriors, of light sandstone, which support the balcony of the principal story. Corresponding with the decorations of the centre pavilion, trophies composed of classic and modern arms and standards are placed over the entablature of the corner pavilions. Semi-circular, tower-like staircases, ending in pointed turrets, have been built on the sides of the pavilions.

The grounds round the building have been prettily laid out, and are surrounded by a railing of stone pillars and wrought iron in keeping with the character of the whole structure.

* See *Builder* of Sept. 8, Sept. 15, Oct. 27, and Nov. 3, 1877, &c.

THE PAVILION OF H.R.H. THE PRINCE OF WALES, PARIS EXHIBITION.

THE HALL.

Coming through the wrought-iron gates which form the main entrance to the Pavilion, one enters the hall, of which we give an illustration representing the right-hand view, with the staircase leading to the jurors' rooms on the first floor, connected across the hall by a gallery running from right to left.

The space to be disposed of was very small; everything has been designed to give the idea of what might be done on a much larger scale.

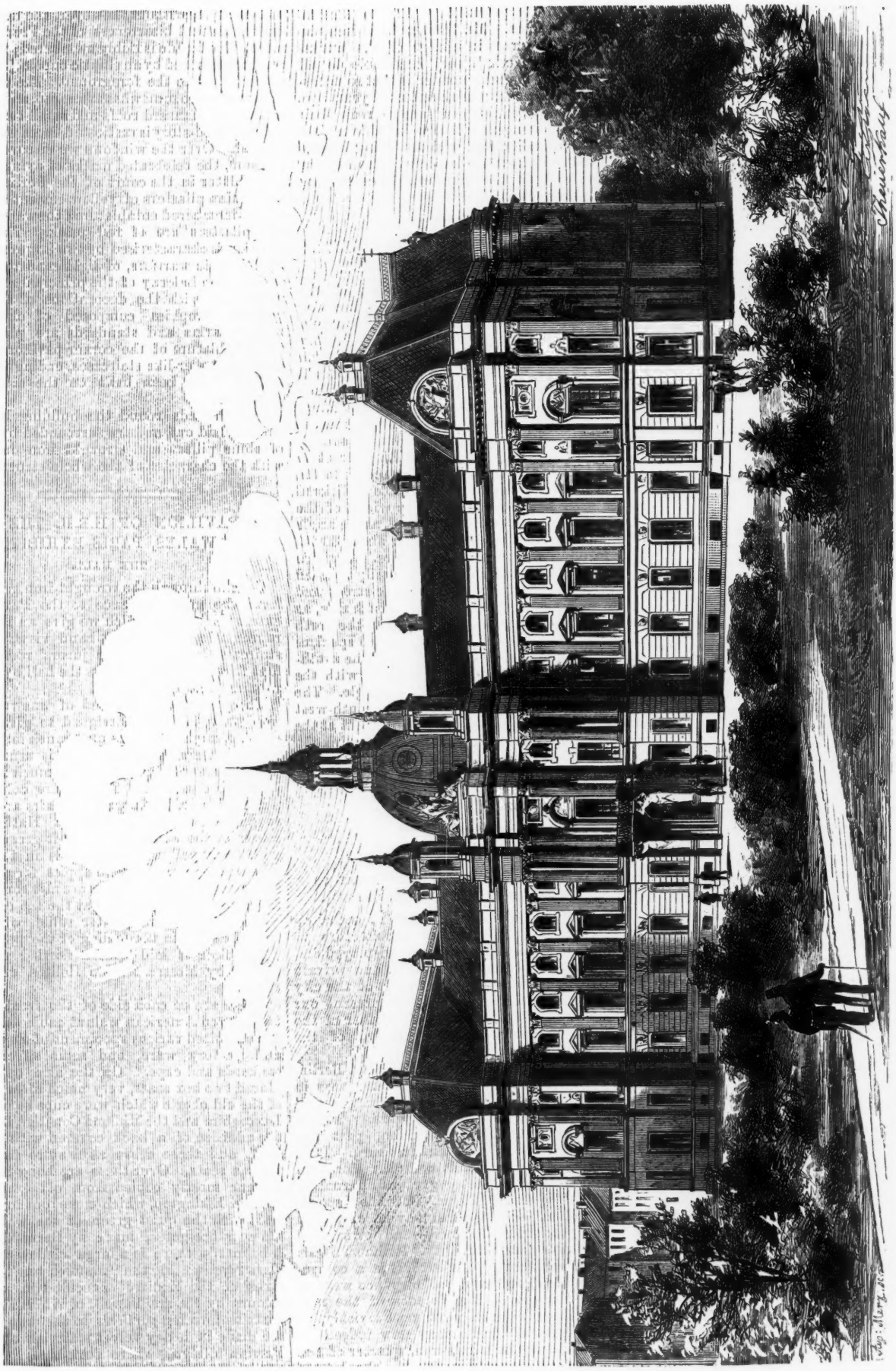
The general style is what is usually called "Queen Anne," but partaking much more of a Jacobean character. The square columns supporting the gallery over the stairs are strongly suggestive of the gallery at Hatfield. The colour of the woodwork is a soft green, relieved with dark yellow backgrounds in the panels, where pomegranates and apples form the chief ornament in relief. There are also some conventional panels in the frieze at the top of the hall.

The ceiling is in plaster relief, with an entwined design in the feeling of the period.

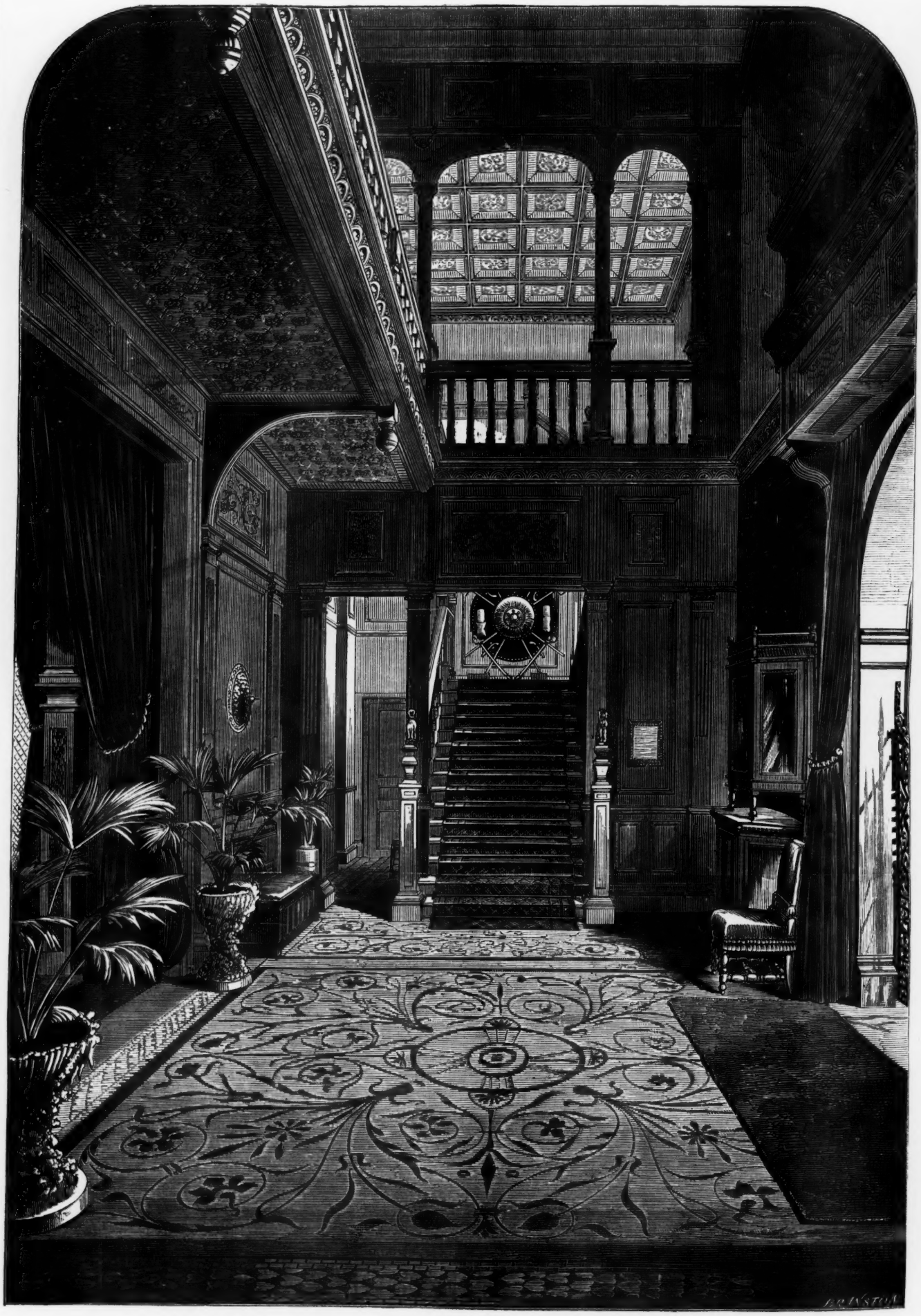
The floor is laid with a flowing pattern in mosaic by Messrs. Minton Hollins, of Conduit-street.

There are on each side of the front entrance two carved American walnut cabinets, in which are exhibited various specimens of English china and pottery ware, and some silver *repoussé* tankards and cups. On the side opposite are placed two box seats, very much after the style of the old chests which were once so plentiful in Lancashire and the Midland Counties, but having the addition of a back covered with embossed stuff, and these serve as a store for rugs as well as seats. Over these are hung trophies of armour mostly copied from old examples by Messrs. Elkington, which come out in mild contrast with the quiet green of the walls. Over the entrance-gates, made by Barnard, Bishop, & Barnards, there is a large window in stained glass representing the "four seasons" and "the signs of the Zodiac," executed in very rich colours by Messrs. Powell, of Whitefriars. The curtains forming *portières* to the two openings are made in heavy velvet materials of a rather Persian design, where dark-blue, green, and yellow are the predominating colours.

The large opening facing the gates leads into the dining-room, which is the principal apartment in the pavilion; and the quiet colour of the hall enhances the effect of the Windsor tapestries which decorate this room. Large vases in blue and white china, filled with palms, give an air of comfort and finish to the apartment. The hall was designed by Mr. H. Henry, and executed by Messrs. Gillow & Co.

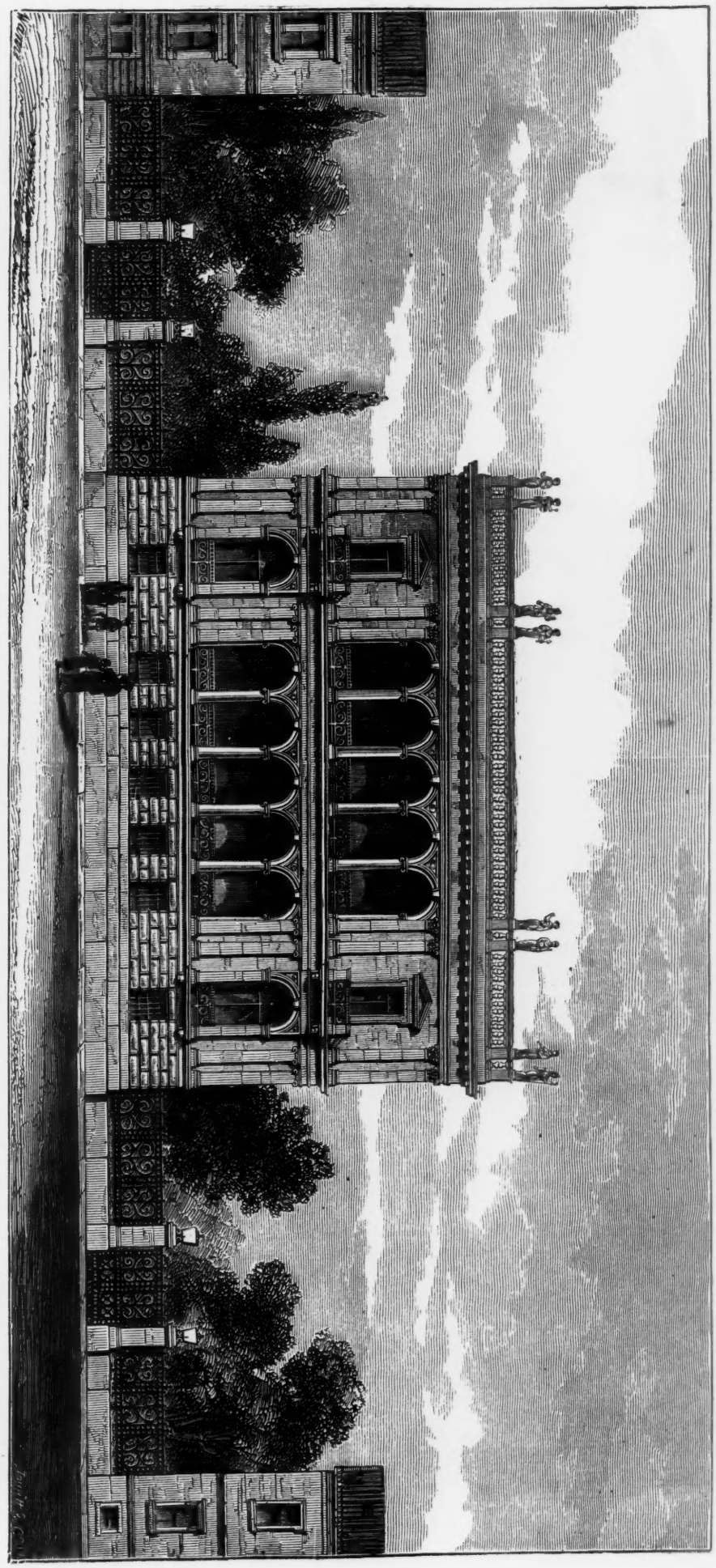


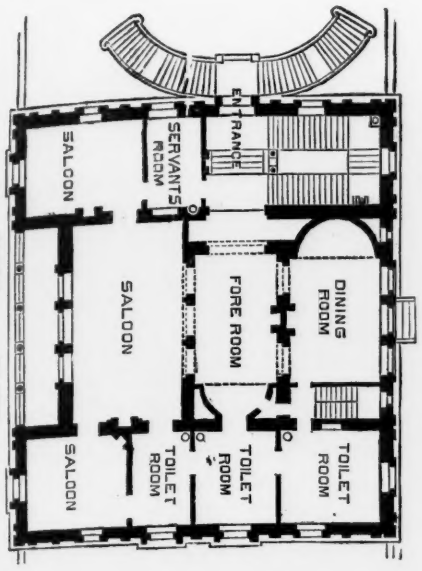
THE OFFICE OF THE INSPECTOR-GENERAL OF ENGINEERS AND FORTIFICATIONS, BERLIN.

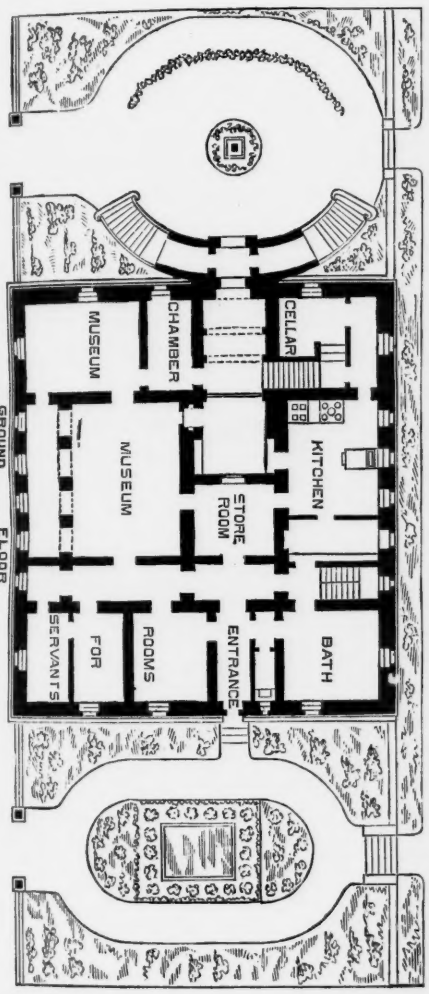


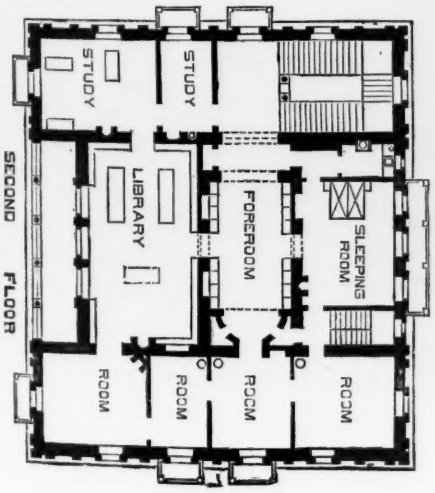
THE PAVILION OF H.R.H. THE PRINCE OF WALES, AT THE PARIS EXHIBITION: THE HALL.

Designed by Mr. H. Henry, and executed by Messrs. Gillow & Co.









DR. HENRY SCHLIEMANN'S HOUSE, IN ATHENS.—Professor Ernest Ziller, Architect.

DR. HENRY SCHLIEMANN'S DWELLING-HOUSE IN ATHENS.

On one of the most beautiful sites in University-street (Λεωφόρος Πανεπιστημίου), close to the Royal Palace, is being built Dr. Schliemann's stately mansion according to the plans of Professor Ernest Ziller. It is three stories in height, and on three sides surrounded by a garden of orange-trees. The apartments on the ground-floor contain, next the front, the collections of antiquities, whilst those on the garden-side serve for the household. On the first floor are the reception-rooms on the front, and the dining-hall and visitors' room on the garden-side. On the second floor are Dr. Schliemann's study and the library on the front, and the sleeping-rooms of the family on the garden-side. All the dwelling-rooms are on the sun-side: and this is an important object at Athens, because the Athenian proverb says:—"Where the sun makes no visits the physician is a frequent guest." The whole building, up to the first floor, is of grey marble; the cornices, window-cases, columns, balconies, &c., are of white Pentelic marble.

There could be no doubt regarding the style of architecture that would be chosen. The proprietor wished to have, instead of a roof, a terrace which does not exist yet in modern Athens, but which was in general use here in Classical times, and undoubtedly it is very congenial to the climate. But it was particularly to be considered that the proprietor is an antiquary, and that all his feelings and thoughts are concentrated in the ancient world. From this reason the rich finds in the excavations at Troy and Mycenæ will furnish the motives for the paintings in the porticos on the façade of the mansion.

All the floors of the house are being made of strong vaults, with iron traverses, and covered with mosaic concrete as in the Italian *palazzi*; with the exception of the doors and windows, no wood enters into the construction.*

SETTING A BIG CHIMNEY UPRIGHT.

During the last two years, upon the premises of Messrs. Storey Brothers & Co., at White Cross Mills, Lancaster, a huge chimney, which will form a conspicuous object for miles around, has been in progress. The dimensions are given below; and we understand that when completed it will be the largest chimney-shaft in North Lancashire. During the last few weeks a very interesting operation has been going on for the plumbing, or bringing to the perpendicular, this chimney-shaft, which we shall presently describe.

Some particulars with regard to the object with which the chimney is being erected, and details of its construction, may not be uninteresting. In the processes connected with the works at White Cross, vapours are unavoidably given off, which, although considered to be by no means insalubrious, have at times a flavour which requires a highly-educated nasal organisation thoroughly to appreciate. In fact, the Messrs. Storey have been led to believe that to some of their neighbours this odour is absolutely distasteful, and they, in consequence, determined to incur the enormous expense of erecting this tall and handsome shaft in the hope and expectation that any vapour which may be discharged from it will be carried away clear of the town, and dispersed and diffused without causing the slightest offence.

The chimney, when completed, will be about 250 ft. in height above the ground. It stands upon a base of concrete 28 ft. square and 5 ft. thick. In plan, the shaft itself is a regular octagon, circumscribing at the outside of its base a circle 25 ft. in diameter. It is a double chimney, that is to say, there is in the interior a cylindrical shaft 8 ft. in diameter, formed of brickwork varying in thickness from 18 in. at the bottom to 9 in. at the top. This is surrounded by a space or cavity, 2 ft. 6 in. wide, enclosed by the outer shell, which is brickwork, 4 ft. 6 in. thick where it rests on the base, and 14 in. at the top, the batter or inclination of the sides being ¼ in. to a yard.

The internal shaft is intended to carry off the smoke from the steam boilers, and the vapours from the stoves, &c., are to be passed off through the 2 ft. 6 in. space betwixt the inner and outer walls. This space is divided into three distinct flues by vertical diaphragms of brickwork, which latter also act beneficially in tying or binding the whole structure together. Above the chimney as it now stands it is intended to carry up the work, principally in stone, for a further height of 30 ft., the cap of the column, which is of a light and elegant character, having been designed by Messrs. Paley & Austin.

The smoke will be delivered from the top, and the vapours from side openings communicating only with the external cavity.

The number of bricks used in the chimney has been 750,000; concrete about 41 cubic yards; and there will be used in the completion of the top 650 cubic feet of stone. The total weight upon the foundation is about 3,300 tons. The bricks used have been the "shale" bricks, supplied by the Caton Brick and Tube Company. As these bricks absorb less moisture than the ordinary brick, they were found most suitable for this work. Mr. C. Baynes was the contractor for the undertaking, Mr. Cornthwaite being the sub-contractor for the brick work. Mr. W. Gunson, the draughtsman at White Cross Mills, acted as clerk of the works.

During the erection of this chimney, or rather after it had attained a considerable elevation, it gave signs of diverging somewhat from the perpendicular, and this divergence ultimately amounted to 3 ft. 10½ in. at the top. The inclination was towards the south, and it is to be accounted for partly because during the two years occupied in its erection very frequent rains kept the mortar soft on the weather side. The result of this was that the joints on that side were squeezed rather closer than those on the other, and the chimney heaved or bent over accordingly. The principal reason, however, must have been that the foundation was a little weak on the south side, and thus yielded to the pressure, the weight on that side being slightly increased, no doubt, by the deflection of the chimney. As it stood, even with a cast of nearly 4 ft. from the plumb, the chimney was perfectly safe, and to many observers the divergence from the perpendicular was not perceptible. To the Messrs. Storey, and especially to the designer of the shaft, Mr. Edward Storey, this was, however, a defect and an eyesore which could not be tolerated, and consequently steps were taken to bring this tall and unwieldy mass back into its proper position.

The work was entrusted to the practised hand of Mr. J. W. Cronshaw, the well-known "chimney doctor," of Blackburn, and it has been most expeditiously and successfully completed. The operation consisted in cutting out courses of bricks in five different places near the base on the north side of the chimney, and rather more than half-way across. These courses, which had originally been practically parallel-sided,—that is, of equal thickness throughout,—were replaced by courses of bricks of gradually diminishing thickness from the end of the cuts on the south, towards the north. Of course, the difference in thickness at the south and north end of the cuts, was, in each case, very slight; but the aggregate diminution of thickness in the five courses shortened the north side of the chimney sufficiently to bring the axis into a truly vertical position. As will readily be understood the cuts were not made right through at once, without some provision being made for taking the bearing of the weight. A width of about 18 in. was first cut right through the 4 ft. 6 in. of brickwork of the outer shell on the extreme north side, a course of bricks being then withdrawn, and the top and bottom joints being thoroughly cleaned off. Into this space, 18 in. wide and rather over 3 in. deep, good hard bricks were then closely packed, these bricks being, as has been explained, with the joint material thinner than those they were replacing. At the outer end good oak wedges were inserted; then similar cuts were made right and left of the first, and similarly treated with bricks and wedges, the work always going on regularly on each side, east and west, from the north towards the south. As this was done the wedges were gradually withdrawn and the chimney quietly settled over towards the north, until when all the five cuts were completed it had come back to the perpendicular. The lowest cut was close to the ground, and the highest about 30 ft. above. Two of the cuts were continued into the internal shaft.

* The elevation is drawn to a scale of about 20 ft. to an inch.

Proposed Vestry Hall, Fulham.—The Fulham District Board of Works has appointed a committee to consider this project.

BRICKS, FROM AN HISTORICAL POINT OF VIEW.*

The science of agriculture no doubt afforded the earliest scope for the exercise of human skill and industry. The Biblical narrative speaks of Abel as a "keeper of sheep," and of Cain as a "tiller of the ground." An application to the mechanical industries allied with arts of construction must, however, have been very early forced upon man, in order to supply implements of husbandry and to provide places of habitation. We read in the fourth chapter of Genesis that Tubal-cain was "an instructor of every artificer in brass and iron," or, according to Gessenius, "a sharpener of every kind of brazen and iron instrument"; a reference clearly pointing to the manufacture of tools required for the purposes of the husbandman and probably of others used in connexion with constructive art, then in its rudest infancy.

There is little doubt that clay, in combination with such materials as would bind it together in a compact mass, was employed in the structure of the primitive human dwelling. In course of time this method of construction was superseded by the use of the same plastic substance, moulded, either with or without other ingredients, into suitable forms, which were afterwards dried or burned, the result being the production of the article now known as "brick." The descendants of Noah are described in Genesis xi. 3 (2247 B.C.) as making bricks and burning them thoroughly, afterwards laying them with "slime,"—or, as some translators read, "bitumen,"—in the place of the mortar now employed for the same purpose. With the bricks thus made they built the tower of Babel "on a plain in the land of Shinar." Some of the best authorities agree in regarding the ruins still standing at Birs-Nimrud, to the south-west of Hillah, near the Euphrates, as being the remains of this tower; and it is a remarkable fact that, after the lapse of ages, the bricks of which it is constructed are so firmly embedded in the bitumen used as mortar that it is no easy task to detach or extract one. The circumference of the tower measures 762 yards, and a conical elevation on the western side rises to the height of 198 ft. The various stages of brickwork are of different colours,—a result which must have been attained by some special process, the ordinary Mesopotamian brick being of a pale yellow or whitish colour. The late Mr. George Smith, the indefatigable Assyrian explorer, deciphered among the tablets in the British Museum a history of the building of this tower, which will be found in his "Chaldean Account of Genesis."

The mounds of Assyria and Babylonia abound with bricks, sun-dried and burnt, Rawlinson, Layard, Mignan, Rennel, and other travellers having found them in incalculable quantity. Modern research has also confirmed the statement of Herodotus, that from the clay thrown out of the trench surrounding the ancient Babylon, bricks were made and burnt, which were used in building the massive walls of the city. The buried palace of Nebuchadnezzar on the Euphrates is said to have furnished bricks for the erection of all the buildings in its neighbourhood for many years past; and we are told that "there is scarcely a house in Hillah which is not almost entirely built with them." Müller, in his "Science of Language," says that the ancient materials from the colossal palaces erected by the great ruler of Babylon were carried away for building new cities, and that Sir Henry Rawlinson discovered numbers of the bricks in the walls of the modern Bagdad on the borders of the Tigris. No doubt can exist as to their identity, owing to the custom which prevailed in Assyria and Babylonia of marking each brick with the name and title of the king in whose reign it was made, and also, in many instances, with the name of the place in the construction of which the brick was to be used. These inscriptions are in cuneiform characters, and were impressed upon the brick in a sunken rectangular panel, closely resembling that in which the name and trade-mark of modern manufacturers of moulded bricks now appears. From the presence of these inscriptions Sir Henry Rawlinson has been able to ascribe the manufacture of some of the bricks found by him

* From Bricks and Brickmaking: an Historical, Technical, and Descriptive Sketch (Hall & English, No. 71, High-street, Birmingham); a pamphlet issued by Messrs. Wood & Ivery, of the Albion Blue Brick and Tile Works, West Bromwich. The strength of the blue bricks produced by this firm is well known; and they are now making steps, copings, and architectural decorations in the same ware, which well deserve the attention of architects and constructors.

to the period of the older kings of Babylon, who reigned about 2000 B.C. In form, the ancient Assyrian bricks closely resemble thick tiles, being generally from 12½ in. to 14½ in. square, and about 4 in. in thickness. They were almost universally shaped in a mould, some being rounded at the corners for quoins or special work. Generally speaking, they were of a pale yellow or red colour. At Kouyunjik, Nimroud, and other places, however, bricks have been found glazed with a thick coating of different colours, some having subjects traced in outline upon them. The walls of the city of Nineveh are said to have been built with glazed bricks of this description, and those of the Median Ecbatana were constructed of coloured bricks. Enamelled bricks, brightly coloured, have also been found in abundance in the mound of the Mujellibeh in Mesopotamia, the principal tints being a very brilliant blue, a deep yellow, red, white, and black.

In Egypt, bricks were used at a very early date, some of the most ancient Pyramids, built at least 2,000 B.C., being constructed of brickwork. The mud of the Nile has always been the sole material employed in the manufacture of Egyptian bricks, and the process at the present day is almost identical with that adopted in the time of Thothmes III., the prince who is believed to have occupied the Egyptian throne at the period of the exodus of the Hebrews, about 1430 B.C. Brickmaking, there is reason to believe, was a royal monopoly in Egypt, and the bricks which have been found bearing the stamp of Thothmes III. are more numerous than those of any other monarch. Nearly all Egyptian bricks, both ancient and modern, are *adobe*, or sun-dried. A few burnt bricks have been found in river walls or hydraulic works, but their use was evidently very limited. Owing to the rich alluvial character of the mud of which the bricks are made, chopped straw or reeds, pieces of pottery, and other materials, are almost invariably used for the purpose of binding the clay together. The modern process is to form a trough or bed, into which mud and water are thrown, together with large quantities of cut straw. The mixture is tramped into a mortar, taken out in lumps, and then shaped, either by hand or in moulds, into the required forms. A painting discovered upon the walls of one of the tombs at Thebes, in which the processes employed in manufacturing bricks are represented with striking minuteness of detail, shows how closely these resemble the method still adopted in Egypt. Some of the workers are depicted as engaged in digging the mud, and mixing it in heaps with sand, while others carry the material thus prepared in baskets to the brickmaker, who is seen shaping it in the mould. Others, again, are employed either in laying out the bricks thus formed upon the ground to dry in the sun, or in bringing from the river, in jars upon their shoulders, the water required for tempering purposes. Labourers, too, are busily engaged in removing the dried bricks upon flat boards, two of these being slung by ropes attached to each end of a yoke placed across the shoulders. Taskmasters are also shown, watching over and directing the operations, stick in hand, ready to inflict summary punishment on the idle or the refractory. Brickmaking, it must be remembered, was regarded in Egypt as a degrading task, and was usually assigned to slaves. It formed the principal occupation of the Israelites during their bondage in Egypt, after the death of Joseph, and the grievous addition to their toil necessitated by the obligation to provide their own straw may be readily estimated from what has been already said as to the process of manufacture. The bricks made by them during their captivity were probably used in the erection of the great treasure-cities of Pithom and Rameses. At a later date, we read of the erection of Egypt of a brick pyramid by Asychis, the monarch whose reign immediately preceded that of Sethos, the contemporary of Sennacherib and Tirbakah, about 700 B.C. This would probably be one of the four brick pyramids still remaining in Lower Egypt in addition to those at Thebes. Two of these are close to the ancient Memphis and the modern Dashour, and the others are situate at the mouth of the Fyoom. They are built of sun-dried bricks, the chambers having arched ceilings. Brick arches are to be found, however, in buildings at Thebes of a much earlier date, the arch having been invented and used in Upper Egypt centuries before the reign of Asychis. The ordinary Egyptian brick approached somewhat to the modern type, being generally from 14½ in. to 16 in. wide, and of a thickness varying from 5 in. to 7 in. In the older pyramids they were of an exceptional size, measuring in some cases 20 in. in length, and about 8 in. in width. The bricks of Egypt, like those of Assyria, bore the names of the kings in whose reign they were manufactured, but, in place of being inscribed, they were stamped, the hieroglyphs being in relief.

In Palestine, in the time of the prophet Isaiah, it is clear that bricks were used in the construction of private dwellings (Isaiah ix. 10), and one of the offences laid to the charge of the people of Israel by the prophet was that of using brick in place of stone, for the construction of their altars (Isaiah lxv. 3).

Amongst the ancient Greeks, who devoted special attention to every branch of constructive art, the manufacture of bricks was placed under legal supervision and brought to a very high perfection. Pliny mentions three distinct varieties as being in general use, and alludes to the circumstance that the walls of the city of Athens, on the side towards Mount Hymettus, were built of brick. Many of the principal public edifices in the leading cities of Greece were also of brickwork,—perpendicular walls of this construction being considered by the Greek architects more durable than those of stone.

Brickmaking was a flourishing industry in the Roman Empire, both sun-dried bricks (*lateræ crudi*) and kiln-burt bricks (*lateræ cocti*) being extensively used in public buildings. All the great existing ruins of ancient Rome are of brick, and there is scarcely a province of the once mighty empire which does not still exhibit striking proofs of the durability of the bricks manufactured, and the skill of the artificers who laid them, in the days when Rome was mistress of the world. In the erection of the Coliseum, 80,000 captive Jews were employed, who probably helped to make the bricks of which the noble structure was built, as well as to lay them. The use of bricks in the construction of the public edifices of Rome was indeed so general as to afford occasion for the remark of the Emperor Augustus, with reference to the numerous and extensive architectural improvements he had carried out, that "having found the city brick, he had left it marble." To enumerate all the great public buildings which thus bear witness to the excellence attained by the Romans in the art of brickmaking would be tedious. Among the most notable, as illustrating the progress made at different stages of the history of the empire, are the Pillar of Trajan, the Bath of Titus (A.D. 70), and the Bath of Caracalla (A.D. 212). Notwithstanding this very general employment of bricks in the construction of public edifices, it may be inferred, from the observations of Pliny, that they were not commonly used in private houses, in the building of which wood was probably the chief material; a view which would seem to be, to some extent, confirmed by the extent and destructiveness of the fires which occurred in ancient Rome. Pliny, after referring to the common use of bricks by the Greeks, condemns them as wholly unsuited for Roman dwellings, in which party walls were not allowed to exceed 18 in. in thickness, and that thickness, he declares, "would not support more than a single story." At this period, the Roman bricks varied considerably in size, but were chiefly of three classes. The largest, known as the Lydian, were 1 ft. 6 in. in length by 1 ft. in breadth, and the others, which were respectively four and five palms in length, took their titles from their admeasurement. They were all very much thinner than the modern brick, more especially those employed as a bond in Roman rubble-constructions, which, in this respect, bore a close resemblance to the wall-tiles of the present day. The kiln-burnt bricks in the Greek building at Troves called the Palace of Constantine, are all "of a square form, 3 in. in diameter, and 1¼ in. thick." The custom of marking each brick, which has been alluded to as prevailing amongst the Assyrians and Egyptians, was maintained by the Romans, the various brickmakers having each their distinguishing mark. Every brick was stamped with the figure of some god, plant, or other symbol, encircled with the name of the maker, the consulate, and the legion by which it was used. The Twenty-second Legion has been traced through Germany by bricks which bear its name, and at Caer-leon, in England, Roman bricks have been discovered with the inscription "Leg. II. Aug.," while others found at York attest the presence there of the Sixth and Ninth Legions. Some of these bricks were scratched on the surface, while others had lumps raised on them, or were deeply notched, with the view of making the mortar adhere more firmly. The Romans preferred, for brickmaking purposes, a clay which was either of a whitish hue or decidedly red. They considered Spring the best time for carrying on the process of manufacture, and it was the general custom to keep bricks two years in stock before laying them.

With the decadence of the Roman Empire the art of brickmaking declined and fell into disuse, but, after a few centuries, experienced a complete revival, the Italian ecclesiastical and palatial architecture of the Middle Ages being distinguished by remarkably fine examples of brickwork and ornamental work in terra-cotta. Towards the close of the seventeenth century, an Italian, named M. Fabbroni, rediscovered an ancient invention, which had been completely lost for many generations, namely, the manufacture of bricks sufficiently light to float in water. Strabo speaks of these bricks as having been made with an earth found at Pisane, in the Troad, and Poseidonius mentions others of a like character as having been made in Spain "of an argillaceous earth, wherewith vessels of silver are cleansed" (probably rottenstone). M. Fabbroni succeeded in producing these floating bricks from "fossil meal," an infusible earth found in abundance over a considerable area of certain districts in Italy. They were only one-sixth the weight of an ordinary clay brick, and on this account were highly esteemed for vaulting church roofs and similar architectural work. The earth of which they were composed consisted, according to Ehrenberg, the German microscopist, almost entirely of the siliceous skeletons of minute water-plants. The bricks with which the arching of the floor in the Berlin Museum is built were made from this material, in combination with a certain proportion of clay "slip."

Among many of the Asiatic nations, bricks of excellent quality have been made from a very remote period, and are to be found in buildings erected centuries ago. A very full account of the history of brick-making in India will be found in the "Professional Papers on Indian Engineering," of Major Falconnet, R.E., published in May, 1874.

In China, bricks are faced with porcelain, and in Nepaul they are richly ornamented by the encaustic process and in relief.

Brick-making was found by the conquerors of Peru to be a flourishing industry in the ancient empire of the Incas, and we have the testimony of Spanish historians, as well as that of Humboldt, Prescott, Stephens, and Squier, that both in Peru and in the more northerly regions of Yucatan and Mexico, there are still extant fine structures in brick, as well as in porphyry and granite, the work of races which have long since passed away.

The scarcity of stone in Holland and the Netherlands naturally led the inhabitants, at a very early period, to seek some other durable material for building purposes, and brick has been almost exclusively employed in the construction not only of private dwellings and commercial establishments, but of ecclesiastical structures and other public edifices. Very fine examples of brickwork in two colours abound, the most notable, perhaps, being at Leeuwardein, in Friesland. The material used in Dutch bricks is chiefly the slime deposited in the numerous rivers and arms of the sea. This is collected by men in boats, who use long poles, furnished at the end with a cutting circle of iron, and a bag-net with which the slime is brought to the surface. Bricks of exceptional hardness are made with a mixture of this slime and sand from the banks of the river Maas. Ordinary house bricks and tiles are chiefly made at Utrecht, from brick-earth found in the vicinity. For the production of the special make of bricks known as "Flemish bricks," which are manufactured in France, Flanders, and the corresponding Belgian frontier, sand from the Scheldt is principally used. At Ghent, as well as at other points lower down the river, the supply of this material constitutes an important branch of the trade of the district. In preparing brick-earth, the slime and sand are well mixed, and then kneaded together with the feet, special care being taken with this operation, so that a perfectly homogeneous mass may be the result. The mixture is then deposited in heaps, and is moulded and dried in the same way as in this country. The kilns used for

burning vary in size, some being large enough to contain as many as 1,200,000 bricks. Peat is the fuel ordinarily used for firing.

England seems to owe the introduction of the art of brickmaking to the Romans. Some specimens of their work which have been discovered date back as far as A.D. 44. The bricks in these early examples are nearly all of the wall-tile form, the use of which, as a bond in rubble constructions, has been already adverted to. These large thin brieks continued in use, under the same conditions, until about the time of the Norman Conquest, when regular masonry gradually superseded rubble-work. A casual reference in the Saxon chronicles shows that bricks were made under the direction of Alfred the Great, but these were probably the bonding bricks just mentioned. The earliest instance of the use of bricks of the modern or Flemish type is said to be afforded in the work at Little Wenham Hall, Norfolk (A.D. 1260). These bricks are of a deeper red than those generally used in Suffolk and the adjacent counties, but paler in tint than the common red brick. The use of brick in England as an ordinary building material, even for important structures, does not seem to have become at all general until the reign of Henry VIII., although there are some few brick buildings of the two previous reigns. Herstmonceaux Castle, Sussex, and the Gate of the Rye House, in Hertfordshire, were built in the early part of the reign of Henry VI., and the following are among the best examples of erections in brick from this date to the close of the reign of Henry VIII.:—Tattershall Castle, Lincolnshire, A.D. 1440; Lollards' Tower, Lambeth Palace, A.D. 1454; Oxborough Hall, Norfolk, A.D. 1482 (about); Gateway of Hadleigh Rectory, Suffolk, close of fifteenth century; the older portions of Hampton Court Palace, A.D. 1514; and Hengrave Hall, Suffolk, A.D. 1538 (completed). Thorpland Hall and the Manor House at East Barsham, both in Norfolk, were built during the reign of Henry VII., and the Parsonage at Great Snoring, in the same county, during that of his successor. The remains of these buildings exhibit some of the finest specimens of ornamental brickwork to be found in this country. Throughout the reign of Elizabeth, the employment of brick would seem to have been reserved for the construction of mansions and other extensive works. In common buildings, the method ordinarily adopted was that of filling in a framework of timber with lath and plaster; and, even when the use of bricks became general, they were only introduced in panels between a framework of timber. In the first year of the reign of Charles I. (1625) the size of bricks was regulated by a special order, and from about this period their use seems gradually to have become more general in shops and private houses, for, on the rebuilding of that portion of London which was destroyed by the Great Fire in 1666, the new erections were all of brickwork. So rapidly did the use of the material spread that the 19th Car. II., cap. 11, fixes "the number of the bricks in the thickness of the walls" of the several rates of dwelling-houses of the period. The records of the Corporation of the City of London also furnish evidence of the favour with which brick had come to be regarded as a constructive material, for about this time a resolution was passed in the following terms: "That they (the City surveyors) do encourage and give directions to all builders, for ornament sake, that the ornaments and projections of the front buildings, be of rubbed bricks; and that all the naked parts of the walls may be done of rough bricks, neatly wrought, or all rubbed, at the discretion of the builder." A special feature of brickwork, at the close of the seventeenth and commencement of the eighteenth century was the enrichment of house-fronts by the introduction of ornaments carved with a chisel. Mr. Dobson's treatise on "Brick and Tile Making," published in Weale's Rudimentary Series, contains a sketch of a house in St. Martin's-lane, built by a person named May, about 1739, which is a fine example of this species of work in red brick. Two fluted Doric pilasters support an entablature, the mouldings, flutings, and ornaments of the metopes, having been carved with a chisel after the erection of the walls.

In the year 1784 a duty of half-a-crown per thousand was imposed on bricks of all kinds (24 Geo. III., cap. 24), the tax being raised ten years after to 4s. per thousand (34 Geo. III., cap. 15). In 1803 a classified schedule of duties on bricks and tiles of different qualities and sizes was substituted for the uniform duty hitherto imposed. Thirty years after (by the 3rd Wm. IV., cap. 11), the duty on bricks was again raised, the common sorts being subjected to an impost of 5s. 10d. per thousand, while tiles were wholly relieved from taxation. These duties were the subject of a Commission of Inquiry in 1836, and in 1839 the 2nd and 3rd Vic., cap. 24, relieved the trade of the vexatious restrictions imposed by the schedule of duties hitherto in force, and re-established a uniform duty of 5s. 10d. per thousand on all bricks "of which the cubical contents do not exceed 150 cubic inches," without regard to their form or quality. In 1850, bricks ceased to be the subject of taxation, the duty being wholly repealed (13 Vic., cap. 9). The development of the brickmaking industry during the first half of the nineteenth century may be estimated from the following statement, in round numbers, of the total make of bricks upon which duty was paid at the close of each decade from 1820 until the repeal of the tax:—1820, 914 millions; 1830, 1,100 millions; 1840, 1,400 millions; 1850, 1,700 millions. Four years later, it was estimated that the total number was considerably in excess of 2,000 millions, the capital employed in this branch of industrial enterprise at that period exceeding 2,000,000*l*.

The employment of machinery in the manufacture of bricks appears to have had its origin either in this country or in the United States. Some of the earliest American patents were taken out in 1792, 1793, 1800, 1802, 1806, and 1807. The records containing the specifications of these inventions were unfortunately burnt in 1836. Prior to June of that year, 122 patents for brick and tile machines had been granted in the United States, and upwards of 500 have since been taken out. In England, as early as the year 1619, we find, among the Specifications of Letters Patent, that the eleventh granted was for the protection of the "Arte of making a certain engine to make and cast clay, &c." This first idea of a machine for making bricks consisted of a large pan or table, containing moulds, which were filled with brick earth and a heavy roller passed over them to force the earth into the moulds. The surplus clay was then scraped off the top, and the bricks were ready for ejection from the moulds. This was, no doubt, a somewhat crude arrangement, but it approaches closely, in principle, the most approved machines of the present day. We do not, however, meet with any record of the introduction of brick-making machines the operations of which were regarded as a practical success prior to the year 1839, when Messrs. Cooke & Cuningham patented one, which was capable of turning out 18,000 bricks in ten hours. In November, 1859, Mr. J. E. Clift, of Birmingham, at a meeting of the Institution of Mechanical Engineers, read a paper describing Oates's brick-making machines, which were then in use at Oldbury. The crushing strength of the bricks made by these machines was said to be 8,024 lb. per square inch as compared with 4,203 lb. in bricks made by hand from the same material. The cost of Oates's machine was from 150*l*. to 200*l*., exclusive of the engine for driving it, and its turn-out averaged 12,000 bricks per day, or about twenty per minute. In 1861, Messrs. Dixon & Corbett had a machine in work in the neighbourhood of Newcastle-on-Tyne which was driven by steam power, and turned out 1,500 bricks per hour. The years 1861 and 1862 were marked by special activity in the production of these machines, the patents granted during this period embracing the following:—Wimball's, Morrell & Charnley's, Green & Wright's, Basford's, Effertz's, Grimshaw's, Morris & Radford's, Poole's, Newton's, Sharp & Balmer's, Platt & Richardson's, Foster's, and Smith's. Up to the year 1868, forty-seven patents relating to bricks and their manufacture had been granted. During the last twenty years many new machines have been invented, and important improvements introduced, and probably over 200 patents for machines connected with the manufacture of bricks and tiles are at present on record.

Harborne and Edgbaston Institute.—On Monday last Mr. Henry Irving laid the foundation-stone of the Harborne and Edgbaston Institute at Harborne, a suburb of Birmingham. After the ceremony he was entertained at luncheon at the Masonic Hall, Birmingham, and made an interesting address.

ROYAL ARCHÆOLOGICAL INSTITUTE AT NORTHAMPTON.*

We continue our notes of the Archæological Institute's proceedings in Northampton and neighbourhood.

On Friday, the 2nd inst., meetings of sections were held in the town-hall, under the presidency of Dr. Evans. Mr. Bloxam read a paper on "The Sepulchral Effigies, both Sculptured and of Brass Incised, of Northamptonshire." He remarked, at the commencement, that Northamptonshire contained as large and varied a series of monuments, sculptured effigies, and incised brasses as any English county, and they have been well and admirably illustr... by a few praiseworthy individuals. Particular mention was made of the labours of Mr. W. H. Hyett, Mr. T. O. Gery (whose collection of r·bbings is now in Mr. Bloxam's possession), Mr. Frank Hudson, and Mr. Albert Hartshorne, the latter's valuable work on "The Recumbent Monumental Effigies in Northamptonshire from 128 scale drawings," being spoken of as one of the most important illustrative works in existence belonging to a single county. One desideratum, Mr. Bloxam said, is still left, viz., complete representations of the architectural features which enrich the monuments, exclusive of the sculptured effigies or incised brasses—features which, in fact, are simply characteristic of the monuments themselves. Confining himself to sepulchral effigies, both sculptured and incised in brass, Mr. Bloxam selected out of some 200 or thereabouts, a few which he considered of the greatest interest, dividing these again into classes—ecclesiastics, judges, knights, or those represented in armour, laymen in civil costume, and ladies. Under the first-mentioned head was noticed the grey marble effigy in Peterborough Cathedral of Abbot Benedict, who died in 1193. There had been monuments in the same place of the last abbot and first bishop, John Chambers, who died in 1556; and Bishop Dove, who held the see from 1601 to 1630, but both are now destroyed. Indeed, we have in the county at the present, not a single sepulchral effigy of a bishop. At Towcester Church there is an interesting effigy of Archdeacon Sponne; and sculptured ecclesiastical dignitaries are also to be found at Aston-le-Walls and Yelvertoft. Incised brasses representing priests may be noted as existing at Newton Bromshold, Woodford, Higham Ferrers, Chipping Warden, Sudborough, Ashby St. Ledgers, Castle Ashby, Rothwell, and Cotterstock. Of legal dignitaries there are within the county no less than five judges, one of incised brass at Wappenham, and four sculptured at Deene, Weekley, and Easton Maudit (two), whilst at Steane there is a white marble effigy of a sergeant-at-law. Of effigies in armour there is a large and wonderful variety, from that in Castle Ashby Church of Sir David de Esseby, who died previously to 1268, to that in Lowick Church of Sir John Germaine, bart., who died in 1718. Mr. Bloxam gave a very interesting delineation of the characteristics of the costume; effigies at Dodford, Hinton, Paulerspury, Warkworth, Ashby St. Ledgers, and Great Brington being particularly cited. He further informed the company that there are in Northamptonshire no fewer than ten sepulchral effigies carved in wood, of which three are ladies and seven knights. They all appear to have been executed in the first half of the fourteenth century,—indeed, it is rare to meet with wooden effigies of a period later than that century. These curious figures are to be found at Woodford, Paulerspury, Dodford, Gayton, Ashton, Alderton, Cold Higham, and Braybrooke. Of effigies in lay costume there is a very rare fourteenth-century sculpture of a forester at Glinton Church. Similar examples exist at Wadworth (Yorks) and Newland, but there are very few in the country. Great Brington, Cottesbrooke, and Maidwell comprise the principal churches in which sculptured effigies in civilian costume are to be seen; the brass effigies of the sixteenth and seventeenth centuries are more numerous, including interesting specimens at Hemington, Ashton, Chipping Warden, Aston-le-Walls, the Church of the Holy Sepulchre (Northampton), Church Brampton, Burton Latimer, Chacombe, and Flore. Of sculptured effigies of ladies, there is a capital series from the latter part of the thirteenth century to an early period of the eighteenth century. In his remarks, under this head, Mr.

* See p. 829, *ante*.

Bloxam mentioned the chaste and beautiful arrangement of drapery in the figure of Scholastica de Drayton,—perhaps the first in chronological order,—and said it must be admitted that in the latter part of the thirteenth and early part of the fourteenth century, the school of sculpture in this country surpassed generally subsequent ages in the pose, freedom, and beauty of design. Barnack, Woodford, Paulerspury, Lowick, Brington, Horton, Charwelton, Edgcott, Norton, Easton Maudit, Weekley, Stowe, Carlton, were all alluded to as furnishing conceits worthy of examination, and the progress in costume was admirably traced.

Mr. Samuel Sharp next read an exhaustive and able paper on "The Bones in Rothwell Crypt," reproducing in the main the arguments advanced by him some years ago at a meeting of the Northamptonshire Architectural Society's Committee for local antiquities.

While these papers were being read, a large number of the visitors were examining the following churches in the town: viz., the Church of the Holy Sepulchre, St. Giles's Church, and All Saints' Church. The recent restoration of St. Giles's was generally commended by the members of the Institute. There are indications of Norman work in the tower; and the western doorway is of that period. The chancel is Early English, and the rest of the church generally Perpendicular. All Saints' Church was rebuilt soon after the fire of 1675, and along the front runs the inscription, "This statue was erected in memory of King Charles II., who gave a thousand tun of timber towards the rebuilding of this church and to this town." The "merrie monarch" also remitted "chimney money" for seven years. The exterior of the edifice presents a strange mixture of architectural styles, retaining still the old Decorated embattled tower (which escaped destruction at the time of the fire), with a modern Italian body and an Ionic portico forming the façade of the west front: yet taking each portion separately archæologists never fail to find subjects for admiration. It consists of nave and chancel, with north and south aisles. The nave is 73 ft. 6 in. by 74 ft., and the chancel 34 ft. 6 in. by 24 ft. The walls of the church are lined with oak, and on each side of the east window are paintings of Moses and Aaron, said to be the work of Sir Godfrey Kneller. The handsome pulpit is formed of Norwegian oak, and the organ, originally erected in 1700, is one of the finest in the kingdom. The register of the church dates from the year 1560.

In the afternoon a large company took carriage tickets for the excursion. The route was by the Wellingborough-road, passing on the way Weston Favel, famous by its associations as the burial-place of James Hervey, to

Earls Barton Church, where Mr. Parker acted as *cicerone* to the party. He remarked that Earls Barton is one of the most remarkable churches in the country, the Anglo-Saxon tower being especially noteworthy. The chancel is also very peculiar, and displays Norman workmanship. A considerable part of the church is Decorated, of the fourteenth-century style, and the woodwork is fifteenth-century, and very good of its kind. The sedilia are very interesting, and the locker in the east wall is very unusual. There is also a low-side window, about which discussion had taken place,—the leper's window. The chancel arch is Decorated of the fourteenth-century, but with Norman springings.

At Castle Ashby the visitors were received at the princely mansion of the Marquis of Northampton by Lord and Lady Alwyne Compton. The castle is built of Weldon stone, in the form of a quadrangle, with two lofty octagonal towers at the north-east and south-west angles, a fine avenue of trees extending from the south front to the deer park. In the large room Mr. R. G. Scriven read a paper on the alterations that have been made at various times in the building; and the Ven. Lord Alwyne Compton, to the gratification of the company, added a few words. Most of the visitors then accompanied Lord Alwyne to the church, chiefly in the Perpendicular style, with some Decorated and Norman work, and consisting of nave, north and south aisles, and porches, chancel, and a small embattled tower, in which are five bells. Among the monuments is a colossal figure of the Angel of Resurrection, by Tenerani.

Whiston Church, which stands on an eminence known as Combe Hill, was the next halting-place, but only for a few moments. The Hon. and Rev. L. C. R. Irby, the rector, produced an old manuscript, which his grandfather received from a Mr. Langley in the year 1800, and which purported to be a history of the church, culled from Bridge's history of that date, with additional notes. This at the commencement gave an account of the village, and the way in which the Catesbys became possessed of the manor. It then went on to record the building of the church in 1534, by Anthony Catesby, the stone having been brought from Ketton and Weldon. Catesby died in 1553, and his monument, of which the villagers are very proud, is displayed in the church.

Cogenhoe Church was the last on the round. The Rector (the Rev. C. H. Burnham) said the church was one of no common interest. They would find the tomb of the founder, Sir Nicholas de Cugenho, in the south aisle, and his coat of arms upon the capitals. Nicholas died in 1280, and, therefore, the church must have been erected before that date. The chancel the visitors could not fail to admire as a fine specimen of Early English work. He (the Rector) had been led to understand that it dated back to 1150, and that it was the then modern part of an earlier church, which Sir Nicholas replaced by the present one.

Mr. Parker, at the invitation of Mr. Burnham, also made a few remarks. He said the church was certainly a remarkable one, and he thought the rector had well supplied the time of its erection. It must have been a few years before the death of its founder.

A *conversazione* was held in the evening at the Town-hall, when a paper, on "The History of the County of Northampton," was read by the Rev. W. Monk, M.A., late hon. sec. to the Society of Antiquaries for the County of Northampton.

On Saturday, the 3rd, there was an excursion to Kettering.

At Kettering Church, the attention of the visitors was attracted by the fine Early Perpendicular tower and spire, which can be seen for several miles around. The nave and aisles are also Perpendicular, and the chancel is Decorated.

Rothwell, with its church and market-house and crypt, was also visited. A drive through a pleasant country lane brought the party to

Rushton Hall, which is built round three sides of a quadrangle, the fourth side being closed by a Doric screen. The house was begun by Sir Thomas Tresham about 1595; continued by the Cockaynes, and finished in 1630.

Geddington Cross was the next place on the list.

Kirby Hall having been reached, the excursionists took luncheon. The hall stands in the midst of woods and avenues near the extremity of Deene Park, and was originally built for Humphrey Stafford by John Thorp in the year 1572. In 1638—1640 Inigo Jones altered the screen which encloses the quadrangle, and built the stately entrance-front, and the walls and gateways of the outer court.

Rockingham Castle was arrived at somewhat late, to the general regret, as a desire had been expressed to make a full and complete examination of Mr. G. L. Watson's noble residence, which stands on the finest site in Northamptonshire. However, under the care of Mr. G. T. Clark, whose loving zeal in connexion with buildings of this description is notorious, the party made the most of their opportunities.

In the evening, Mr. S. Tucker (Rouge Croix) read a paper at the Town-hall on "The Descent and Varying Armorials of the Spencers of Wormleighton and Althorp."

On Sunday, the 4th, the Rev. Canon Pownall, F.S.A., preached in the Church of the Holy Sepulchre, making special reference to the proceedings of the Congress.

On Monday, the 5th, a large company went by rail to Oundle, and thence in carriages to Cotterstock Church, the characteristics and history of which from its foundation in 1337 by John Giffard, canon of York, to its recent restoration by Mr. Street, were described by the Rev. A. J. Abbey. Tansor Church and Fotheringhay Castle were also visited.

A meeting was held at the town-hall in the evening, under the presidency of Lord Alwyne Compton, Sir Henry Dryden, bart., being among the company. Mr. J. Tom Burgess first gave an address on "The Opening of the Clarence Vault at Tewkesbury," and urged the Institute to utter a protest against the mercenary exhibition of the relics found therein.

The Rev. A. Foster, of Farndish, read a very interesting paper on "Eastern Maudit."

The general concluding meeting of the Institute was held on Tuesday, the 6th inst., after which there was an excursion to Canons Ashby, the seat of Sir Henry Dryden.

During the meeting of the Congress, a loan museum of local and general antiquities was opened under the management of Mr. R. Ready, of the British Museum, the hon. curators being the Rev. H. J. Bigg, F.S.A., the Rev. F. C. Alderson, and Mr. J. B. Hensman.*

THE DECORATION OF ST. PAUL'S.

Sir,—Many suggestions have been made by competent advisers as to the best course to be adopted in embellishing our metropolitan cathedral, yet after all, there is the common-sense view, as well as the transcendental, to be taken of a proposed scheme of decoration.

A terrible fuss is being made about the proposal to *redecorate* the dome; but I venture to think that it would be better for art, the cathedral, and the public, if our decorators would restrain their lofty flights and aspiring conceptions and commence operations a little nearer *terra firma*. It is annoying to the public when pictures are hung too high at the Academy exhibition, and this annoyance cannot but be aggravated when paintings of more than ordinary merit are elevated 100 ft. above the heads of the spectators. Thornhill's design may be very fair, and possibly many persons consider it bold, lofty, aspiring, &c.; but *common sense* deprecates the idea of contemplating it with your head thrown back and neck twisted until you are blue in the face. I have never known any one to stand and gaze for five minutes at the dome of St. Paul's without being more impressed by pains in the neck than with the beauty of Thornhill's painting. I would suggest that if the dome *is* to be painted, visitors should be provided with lounges, so that they may lie upon their backs, and contemplate the "mysteriousness" of the dome with less discomfort than at present is absolutely necessary. "Meter," in the *Builder* for August 3, says that Sir James Thornhill's design "is simple, and architecturally unites itself with the edifice," and he suggests that designs in colour should be substituted for the present monochrome figure-subjects, leaving it to the reader to imagine what would be the "splendour" of the result. Exception must be taken to these statements, not, however, in a captious spirit, but merely with a view to ascertain what is legitimate and truthful in art. In the first place, the architectural divisions of Thornhill's design are its chief artistic fault. Under ordinary circumstances, their introduction into a picture would not excite adverse criticism, as no doubt would exist as to their being anything but pictorial representations, but their present introduction is not in accordance with the true principles of design, as they are but sham painted architecture. An endeavour is made to give reality to the pilasters by giving them relief with shade, and showing the soffits of the arches. This apparent reality is emphasised by the pilasters of the decoration continuing the structural lines of the pilasters round the drum of the dome. Practically, it would be absurd to see stone piers or pilasters accommodating themselves to the concave surface of the dome; and for the purpose of pictorial division painted ribs would be less unsatisfactory. If divisions are desirable, they should,—unless executed without relief,—be architecturally real and structural. The panelling supposed by "Meter" to exist under the surface of the present painting would be far preferable to the sham architectural divisions of Thornhill. It cannot be denied that there is a striking boldness displayed in Thornhill's composition. The faults lie not so much in the design as in its position. Again, it is a question worthy of consideration whether, in the event of there being no structural divisions upon the surface of the dome, it is desirable to describe false ones? Personally, I could conceive it possible to treat the decorative subjeccts with more dignity, regarding the dome as a broad endless frieze, than by dividing into sections, either by circles or other means.

Some persons have expressed a fear that painting in colour will rob the dome of its "aërial mysteriousness." Nothing will tend more to such a consummation than the introduction of figure-subjects. The human figure constitutes to the eye a perpetual standard of measurement. We judge of the heights and dimensions of

* The local newspapers, the *Herald* and *Mercury*, have contained very full reports, and to these we have been indebted.

buildings by comparison with the individuals in or around them.*

Figure-subjects, if executed life-size, would scarcely be perceptible at such a height, and if designed upon a colossal scale would naturally dwarf everything in juxtaposition to them. It has been the fashion to paint figure-subjects upon ceilings,—and a dome is but a concave ceiling,—ever since Michelangelo and Raffaelle essayed to decorate the Sistine Chapel and St. Peter's. Great masters, however, are not equally great in all things, and whilst lavish in our commendation of their unequalled skill as painters, we are bound to admit that as *decorators* the greatest painters have perpetrated shams that cannot, upon any theory of art, be excused. They obtained fictitious relief by means of painted architecture, thereby clearly showing how easily it is for even genius to fail when employed out of its legitimate sphere. A dome, vault, or ceiling is simply a covering, and as such should be treated. A *picture* upon a flat ceiling is bad, but upon a concave one it is worse. A ceiling should be so decorated as to be equally effective from any point of view, and this is impossible with figure-subjects. Saints upon their backs, and apostles standing on their heads, may be edifying to some people, but a circus clown would be more sublime than a patriarch painted up-side-down for a thousand guineas. The common-sense procedure is that laid down in the *Builder* for June 15, as follows:—"That where it is intended that a building should be ultimately decorated with mural painting, the whole scheme should be conceived from the first, and the architectural details should harmonise with and, where possible, be suggestive of, the pictorial subjects which are to form the crown of the whole. And it appears to us that it is directly the province of the architect rather than of the painter to conceive or invent the idea of the whole result, though he cannot carry it out himself."

The above suggestion cannot be carried out in its entirety, as the building is already erected; but the next best thing could be done. An architect could be employed to prepare a general outline for a scheme of decoration for the entire building, suggesting the nature of the different subjects and their styles, but leave the painters so far without restriction that they may impress their own individuality upon their conceptions. The piecemeal method now being adopted can never lead to satisfactory results. The decorative scheme should be carried out upon some definite and comprehensive method, so that the present generation who have subscribed may have the gratification of seeing the results of their munificence. Upon entering the cathedral we are conscious of something lacking. The bare stones are cold and uninviting. If other evidence were wanting that Wren intended the interior of his *chef d'œuvre* to be decorated, it is to be found in the preponderance of bare wall surface unrelieved by ornamentation of any description whatever. Another matter not to be lost sight of in preparing a comprehensive system of decoration is to endeavour, as far as practicable, to render the height of various portions of the interior more consonant. The height of the dome is so excessive compared with the nave and transept that these latter appear ill-proportioned and low. A system of decoration must, therefore, be improvised that shall tend to give greater apparent height to the arms of the cross without altering the normal appearance, as regards height, of the dome itself. In other words, the nave and transepts must be made to suit the proportions of the dome, and not the latter reduced in apparent altitude to suit the other internal portions of the structure. I know not what the members of the "committee" may think, but the majority of common-sense people must admit that if a building like St. Paul's is to be decorated in *patches*, having no regard to a scheme in its entirety, the better plan would be to commence at the bottom rather than at the top of the building, for by this means alone can success be guaranteed with any approach to certainty. If St. Paul's is to be decorated by the finest display of talent which the country can command, and at an expenditure of thousands of pounds, it is but reasonable to expect that the paintings will be placed so as to be seen with *ease, pleasure, and advantage.*

Let the shade of Thornhill remain undisturbed awhile, until the other portions of the cathedral have been decorated, and another generation shall arise wiser than the present.

Bad art has already desecrated the interior in that the most sacred part of the edifice. The intermediate surface of the chancel vaulting between the ribs is in reality plain, but an attempt at relief has been obtained by painting sham caissons.

There is an effective bit of ceiling decoration to the cove over the communion-table in the chapel on the north side of the nave. Here the colour is merely applied to the structural relief. If an artistic lie is already perpetrated in the first *patch* of decoration, what may be anticipated by the time the whole is completed? Surely if, under any circumstances, the introduction of unreal and fictitious art is to be deplored, it is when applied to such an edifice as St. Paul's Cathedral. The very nature of the building calls for the highest excellence, unsullied by aught that is meretricious or untruthful. The committee would do well to call to mind the observation of Ruskin, and act upon it, "that modern architects decorate the tops of their buildings, whilst Mediæval architects decorate the bottoms of their buildings. That makes all the difference between your seeing the ornament, and not seeing it. You increase the cost of your buildings by one-half, in order to mince their decorations into invisibility."

JAMES GEO. BUCKLE.

P.S. Since writing the above, I have again visited the cathedral. The manner in which the caissons, or octagonal panels, are painted between the crown of Thornhill's arches and the eye of the dome, is a successful attempt at decorative deception. The introduction of coloured pictures between Thornhill's painted architecture would only tend to make the deception I have alluded to all the more realistic. It is only the monochrome treatment which prevents it being a painted imposition.

* It is a favourite trick with architectural draughtsmen to make their figures in perspective drawings disproportionately small, thus giving a fictitious importance to the building.

IS THE BLACKNESS OF ST. PAUL'S MERELY THE EFFECT OF SMOKE?

SIR,—In connexion with the above subject, Professor Paley appears to have lost sight of wind and weather. Now, it is a well-known fact that, in London, the prevailing winds are from the south and west, principally south-west; also, that they bring much rain; and my opinion is, that the appearance of the stone on the north side of St. Paul's, and to a great extent on the south-east side and east end, is the result of smoke and dirt. Also, that the appearance on the south-west side is the result of bleaching from exposure to wind and weather. If proof of this be required, examine a portion of the stone which, although on the south-west side, is by its position protected from wind and wet: it will be found nearly as dirty as any on the north side. But, take a large surface of the stonework,—say, from the south-west angle of the south transept to the south-west angle of the clock-tower,—then draw a horizontal line from the cathedral to the top of the warehouses opposite, and mark the effect of the wind and wet according as such surface is or is not protected by the warehouses,—it is all bleached; but that above the level of the tops of the warehouses, in a far greater degree than that below. I could give many such examples of bleaching on the same kind of stone from the south-west, whilst the protected sides are dirty and begrimed. One only: the south-west side of the pillars of the Royal Exchange portico.

C. M. G.

SIR,—The very interesting notice in the current number of the *Builder*, respecting the blackness of the outside of St. Paul's Cathedral, calls to mind a remark in one of the letters forming the published well-known correspondence between Mrs. Carter and Miss Talbot. It is dated from the St. Paul's Deanery, March 14th, 1752, and is as follows:—"We are still extremely well pleased with our situation, the air (the smoke, I should say; for there is a sugar-baker just by that is candying us all over as fast as he can), the exercise, the way of life, agrees with us all very well." The letter which contains the above is one written by Miss Talbot.

CIVIS.

Salkeld.—Plans have been approved for the restoration of Great Salkeld Church, Cumberland, prepared by Messrs. Hetherington & Oliver, of Carlisle, and the works are now in progress under their direction.

A CURIOUS COLLECTION.

Two generations have been sedulously storing up a wealth of art-work, various and almost innumerable in detail, but now to be distributed amongst the connoisseurs of all art-loving nations. In a narrow street near to Bedford-row, many a passer-by who, in his youth, had a "stool" in one of the legal firms in the neighbourhood, has observed an old-fashioned shop with many choice engravings in the window, and has longed for the time—"looming in the future"—when his improved position in the office should enable him to enter the dingy portals,—always closed, its owner being absent for the past twelve years,—and make himself famous in the eyes of collectors by becoming the possessor of some of the rare things therein. But the youth has arrived at maturity, has become possessor of the means to purchase, yet his efforts to do so have been fruitless: the same choice prints have remained in the window. As an answer was required for repeated inquiries, all were told,—"Nothing will be sold until the owner returns." Two collectors of prints, whose homes are on the other side of the Atlantic, finding that there were in this collection prints they coveted, took the long journey across, in the hope of acquiring them, but without success. The same answer met their inquiries. A wealthy man in London sent 10,000*l.* for two paintings in the collection. That was refused. Other pictures equally valuable are there,—rare works,—whose pedigrees are well known, and whose qualities are not questioned. The owner has not come back. He has gone, it is to be hoped, where he will find beauty in perfection, not in the abstract, as in his possessions here. The gems of art that he has so strangely accumulated will be reset. They are somewhat tarnished, and many will enjoy what only one hitherto has possessed. Their late owner was one who seemed to have a mania for the acquisition of such things, inherited from a parent equally peculiar. The desire was to possess them, rather than to deal in them. If a fine picture were included in an auction-sale anywhere in the country, his practice was to go thither at once, and keep as near as possible to the coveted work until he became its possessor, and then to hurry away and bury it in seclusion.

It is believed that, after the labour of cataloguing the property has been accomplished, it will be placed, about January next, before the public in the Rooms through which it seems the fate of most works of art to pass at some period or other.

DEFECTIVE COUNTY COURT ACCOMMODATION AT HASTINGS.

SEVERAL buildings of a public character have recently been erected in Hastings, but, according to the following statement of the Hastings County Court judge, made this week, the local authorities would do well at once to employ an architect and a builder in the erection of a new County Court. It appears that the judge has caused some offence by his late attendances, and, referring to the matter on opening his Court in the Market-hall, on Monday, he made certain remarks which had at least the merit of being plain and outspoken. Whatever blame there might be in the case, he said, the censure lay at the door of the Corporation, and not on his shoulders, inasmuch as, owing to the lack of accommodation, he was compelled to wait while the undisputed plaints were being disposed of by the registrar. To obtain access to the court he had to enter a public-house, and the only available private room was in a public-house. He had to attend between thirty and forty courts in the Sussex district, and he did not hesitate to say that that of Hastings was the worst of all. It was a disgrace to the town, and both the inhabitants and the Corporation ought to be ashamed of it.

Public Works Department, India.—The Government of India have passed a resolution convening a conference of the representatives of Indian Railways in Calcutta next November, to discuss various points of railway administration. We willingly mention that the Secretary to the Government of India in the Public Works Department will be glad to receive papers or communications from any one interested in the subject.

PROGRESS OF BUILDING ON THE HATCHAM MANOR ESTATE.

The large estate at New Cross, known as the Hatcham Manor, which was some time ago purchased by the Haberdashers' Company, and by them laid out for building purposes, is rapidly being covered with semi-detached residences, upwards of 100 houses of this class having already been erected, whilst several others are in progress. Under the stipulations laid down by the Haberdashers' Company, there is to be strict uniformity in their architectural features and appearance (why?) with the exception of those to be erected on the high ground, near what is known as Telegraph-hill, which, we understand, are to be of larger dimensions than the rest, and will stand within more spacious grounds. Several of this last-named class of residences are now in progress. On the south-east side of the estate the level of the land is much higher as it rises to Telegraph-hill, than that of the new road which has been made through the estate, and which gradually ascends until it attains an elevation which commands a panoramic view around the south-eastern portion of the metropolis. The high ground to the south-east side of this road is about to be reduced to the road's level, and this will involve the removal of several thousand cubic feet of earth. A bed of clay has been found to lie under the surface, and bricks are about to be made on the spot previously to levelling the ground and building upon it.

The Haberdashers' Company have undertaken to build a church on the estate, and the works have just been commenced. The site of the church is at the summit of the hill, immediately opposite to the new Haberdashers' schools which the company recently built on the estate. We believe that the designs have been prepared by the company's architect, and that the builder is Mr. Snellgrove, of Gloucester.

SHEFFIELD.

The Jessop Hospital for Women has just been opened. It has been erected at a cost of something over 30,000*l.*, at the sole expense of Mr. Thomas Jessop, a wealthy merchant, and at one time mayor of Sheffield. The style of building is freely-treated Elizabethan, and it has been designed by Mr. J. D. Webster, architect, of Sheffield, under whose supervision it has been built. Although somewhat cramped up, it stands in a good part of the town. It has three frontages, facing respectively towards Leavy Greave, Gell-street, and Victoria-street. The main point is towards the first-named thoroughfare, and from the central part of this, over the principal entrance, rises a lofty tower. The structure is built of red brick, with dressings of Hollington stone; the gables are numerous, and well broken up; the chimneys are tall and of moulded and cut brick; and the steep-pitched roofs are covered in by grey Welsh slates. The parapets are of worked and pierced stone. The building is surrounded by a dwarf stone wall, surmounted by wrought-iron rails. The internal arrangements show a well-chosen plan, and the comfort and health of future patients has evidently been carefully thought out. Upon the ground floor the apartments are devoted to board, waiting, and governor's rooms, and to the dispensary; and upon the three upper floors are the various wards. These latter are reached by an imposing staircase, whose windows contain excellent stained glass, by Messrs. Powell, of Leeds. The long broad corridors, that cut the building from end to end, are laid with encaustic tiles, by Messrs. Maw, of Broseley, and the whole of the carved work is by Mr. Harry Hems. The general contractors were Messrs. Chambers & Sons, of Sheffield. The warming and ventilating are by Mr. Phipson; and the plumbing by Mr. Corrie, of Sheffield. Mr. Kenyon was the slater and Mr. W. Robinson the painter, both of Sheffield. The clerk of works was Mr. Payne.

THE PORTLAND ESTATE.

Mr. Charles Fowler, of Upper Woburn-place, has been appointed by the Duke of Portland as surveyor to his Grace's Marylebone estates, in the room of the late Mr. Henry Baker, of Gower-street. Mr. Fowler's friends, and they are numerous, will hear of this announcement with much satisfaction.

ODOURS FROM CYPRUS.

Leave Mr. Eugene Rimmel alone to make the most of every passing event. While others are sending capital to Cyprus, he gets a capital scent out of it, and calls it "Extract of Cyprus Flowers, culled in Paphian Bowers." Whether by any other name it would not smell as sweet, we need not inquire; he has, wonderful to say, sent us a bottle of it, and we certainly smell sweeter since we used it, and feel more respectable. Some perfumes have unquestionably an elevating sort of tendency; they send one involuntarily to "Araby the bless'd," and the Oriental poets. It was a matter of course that we should soon get a scent from the love-worshipping island, for in the earliest times the fragrance of its flowers gave it a name, which translated, means "The Plaything of the Goddess of Love."

This passion, by the way, has always played such a part there that it was anciently said the exuberance of Nature in Cyprus served to stifle every higher feeling in sensual enjoyment. Yet what a wonderful story the island has, ranging from prehistoric times till now. Any distinguished conversationalist who has looked this up, and wants a cue for its delivery, need only touch his handkerchief with the "Extract of Cyprus Flowers," and there he has it at any moment that may seem fitting. After he has alluded to the Phœnicians, described the Temple of Aphrodite, to which no women were admitted; and sketched the connexion of the island with Egypt and Rome, he must not forget that our own Richard of the Lion Heart had hold of it once, and gave it to the Templars; and our *raconteur*, after a brief allusion to *Othello*, probably quoting something about frighting the Isle from her propriety, may wind up wittily with the expression of a modest hope, that English poets will now improve since we possess in Cyprus a Mount Olympus of our own. After this ingenious commendation of the new scent, if the inventor of it does not send us a box of gloves, we shall say there is no gratitude in Man or Rimmel.

THE PLASTERERS' COMPANY'S PRIZES.

The following is the result of the seventeenth annual competition for prizes offered by this Company in connexion with the Science and Art Department, South Kensington:—

For an original design in monochrome, for a ceiling of a room, with centre for chandelier.—*First Prize*, C. E. Wilson, of the Sheffield School of Art; *Second Prize*, J. M. Benson, of the National Art Training School, South Kensington.

Second: For an original design, modelled in plaster, for a portion of a ceiling centre.—*First Prize*, H. Harvey, of the National Art Training Schools, South Kensington. *Second Prize*, W. Wallen, of the Westminster Royal Architectural Museum School of Art.

The competition drawings and models are now on view at the Annual Exhibition of National Art Students' Works, South Kensington.

WEST LEAKE, NOTTS.

The parish church, dedicated to St. Helena, has been re-opened, after restoration. It is in the Decorated style, and consists, in the main, of nave, south aisle, south-west porch, north transept, and chancel. The south aisle and the clearstory have been rebuilt, and the nave and aisle covered in by new open-timbered roofs. These are of pitch pine. There is an open turret for two bells over the western end,—it is a unique feature. The roofs are of steep pitch, covered by warm red tiles. The ivy upon the east end has been left growing as heretofore. The apex of each gable is surmounted by a foliated cross in worked stone. The roofs are carried by massive stone corbels; the aisle-roof is a lean-to one. The seating in the body of the church is of pitch pine. The pulpit, the reading-desk, and the chancel-stalls are of well-seasoned oak. They are massive in construction, well moulded, and carved. The chancel is approached from the nave by a rise of two steps, and two other steps, further eastward, give the line of the altar. The pulpit stands upon a stone base outside the chancel, upon the north side, but is approached by four steps from within. The doors throughout the building are of oak, upon framings of pitch pine, and the chancel floor and the avenues in the body of the church are laid with encaustic tiles. The glazing is in the cathedral tinted glass. In the east end a stained-glass window has been put in. The subject is the Resurrection, and is the work of Messrs. Heaton, Butler, & Bayne, of London. The altar-rail is of oak, with wrought-iron standards. The reredos is of Caen stone, and consists of an arcade of eight bays. The columns are of serpentine, and the recesses are filled in with polished alabaster. The central panel has a plain Latin cross thereon, of pure statuary marble. The upper part of this reredos and the capitals in its arcade are ornately carved. The church contains several highly interesting tombs, and other curious architectural remains. The restoration has been carried out by Mr. Henry Black, of Barrow-on-Soar, near Loughborough, from the designs and under the immediate superintendence of Mr. Henry Hall, architect, London. The stone and wood carving is by Mr. Harry Hems. The cost of the renovation has been liberally defrayed by Lord Belper, whose seat at Kingston is in the immediate neighbourhood.

ST. ALBAN'S ABBEY CHURCH.

A meeting of subscribers of 10*l.* each was held in the town-hall, St. Albans, on Saturday last, to consider the question which has arisen as to the renewal or otherwise of the roof, the chair being occupied by the Bishop of St. Albans. Communications on the subject from members of the Society of Antiquaries, of the Society for the Preservation of Ancient Monuments, and from individuals, were first read.

Sir E. Beckett submitted the following resolution:—"That the roof of the nave having become ruinous, it is desirable to restore it to the original pitch indicated on the tower, keeping as much of the pointed and panelled ceiling as may be in a sound condition, restoring the rest in similar style."

Mr. W. Jones Loyd seconded the motion.

Mr. Evans proposed the following amendment:—"That this meeting recognises the propriety of the late Sir Gilbert Scott's desire to preserve the old roof of the nave as an interesting portion of the Abbey, and inasmuch as it appears from the architect's report that this roof can be rendered perfectly good and serviceable, recommends that it be repaired accordingly."

The Earl of Verulam seconded it.

Mr. Scott said that his father had never discussed the question with him; but he had no doubt his opinion would have been in favour of a high-pitch roof if the matter had been brought definitely before him, seeing that he had put a high-pitch over a low-pitch roof at Selby, and desired to do the same at Rochester. He did not think the present roof was past repair, but it would cost 3,000*l.* to make a complete job. He endorsed for a new roof the use of Memel timber, but preferred lead to slates as more dignified in appearance.

Archdeacon Grant then spoke at some length, arguing strongly in favour of the retention of the old roof by adequate repairs.

Several other gentlemen took part in the debate, and finally the original motion was carried by fifteen to five.

PORTLAND CEMENT TESTING-ROOM.

Sir,—My absence from town prevented me until now replying to your correspondent, "W.," respecting the above, in your issue of the 27th ult.

I have no desire to fill your pages with a wordy correspondence respecting the utility of testing cement, or the value of an independent testing-room; but as the question of your correspondent has been put to me many times by others situated as he seems to be, I may perhaps so far trespass on your space as to state that if users of cement would specify that from all deliveries of cement a sample would be taken indiscriminately from several sacks (or barrels, as the case may be) and tested, the difficulty of your correspondent would be overcome. Of course, if the manufacturer is to send the sample for testing, he might, if so disposed, deliver a different quality of cement to that sample; but if the samples for testing are taken from the cement already delivered on to the works, the manufacturer would be obliged to deliver such cement as would stand the required test, or he would risk having the whole delivery returned on his hands. H. Faija.

ARCHITECTURAL COMPETITION ILLUSTRATED.

RHYME AND REASON.

Twelve architects once, so runs the tradition,
Sent in their designs for a spacious town-hall:
There was, to be sure, a fierce competition;
Eleven were worsted, and went to the wall.
And hear it, ye "sold," the architect chosen
Was told beforehand he would be the man.
Entre nous, said the Board, designs near a dozen
Will help our elect to improve on his plan.—H.

THE COST OF BUYING UP THE WATER COMPANIES.

Sir,—Will you allow me to correct an error in the press in the recently published official account of the National Water Supply Congress, which is calculated to perplex those readers who take an interest in the London water supply? I am there reported to have said, speaking of the New River Company, "in the Government returns the capital was put at thirteen millions." I said, not thirteen, but three. The only figure returned under the head of that Company's capital expenditure, to December 31st, 1876, in the "Statement of Accounts of the Metropolitan Water Companies" for that year, is 2,892,802*l.*, although it is stated that the conditions of the property are peculiar. According to an article in the *Pall Mall Gazette* of May 18th, 1878, the least value at which the property could be estimated for compulsory purchase is 11,377,000*l.* But this is allowing only twenty-five per cent. above market value. The award in the case of the Stockton and Middlesbrough Water Company, which is relied on by the advocates for the acquisition of the existing water properties "as a settled leading precedent," gave twenty-five years' purchase of statutory dividends, to which 45½ per cent. was added, by Mr. Higgins's award, for compulsory purchase, besides a sum equal to rather more than half that compensation for "statutory and other debts." Thus for purchasing a property which the Mayor of Middlesbrough stated might have been obtained by negotiation for 550,000*l.*, the award came to 789,977*l.*; and the total cost, including that of arbitration, will come to at least 850,000*l.*

I find that the sum set down (in Mr. Chadwick's estimate of twenty-six millions sterling for all the water works) for the compulsory expropriation of the New River Company was 7,434,157*l.*, instead of 11,377,000*l.* At the rate of the Middlesbrough award the sum required for the purchase of the eight London water properties would be 31,001,500*l.*

Francis R. Conder.

A GALLERY OF AUTOTYPES FOR THE ILLUSTRATION OF HISTORY, AND OF THE PROGRESS OF ART.

Sir,—I have proposed that a Gallery of Autotypes, instead of a Gallery of Casts, should be formed for the more comprehensive purposes set forth in the "heading" to this letter, not only for illustrating the history of Grecian sculpture, as suggested by the memorialists for a Gallery of Casts, but the entire history of art—pictorial, sculptural, and architectural; and this, too, at a comparatively trifling cost of money and of space. Plaster casts are doubtless necessary evils, but they are subject to discoloration, to distortion in piece-moulding, and to deterioration from repeated coats of paint. If not painted, they become begrimed with dust, and unsightly. A Museum of Casts, too, would necessarily be laden with specimens of early Grecian sculpture, which would be by no means calculated to improve public taste. The end proposed by the advocates of a Gallery of Casts is, that lectures should be given to students of the Classics, on the history of Grecian sculpture. Surely autotypes would equally well answer the purpose. A gallery, too, in which autotypes were hung, could, from time to time, be utilised for other purposes. But what, I would ask, does this constant lecturing on the history of art come to? Simply this, that art was in all the great epochs gradually developed, *pari passu*, with civilisation,—from crude beginnings to the fulness and completeness of maturity. And this in every case by the employment of artists on great public works. Surely men's brains must have been reduced to a very pulpy state to require thousands of pounds to be spent on either a Gallery of Casts or of Autotypes, to teach them this. For the illustration of Grecian and of Italian history, photographs would certainly answer the purpose. If, however, it is considered to be absolutely necessary that Grecian sculpture should be presented bodily to the eyes of the student, that want is sufficiently met by the collections in the British Museum, and by something better than mere plaster casts,—the marbles themselves, with the touch of Phidias, in some cases, fresh upon them. And for the intimate and profitable study of Grecian art as a training for taste,—if taste can be instilled by such means,—nothing could possibly surpass the collection in the British Museum, were the new one even ten times as extensive. We have possessed this unique collection for more than half a century, and few but students of the fine arts ever study it. A professor has never even yet been appointed to direct the studies of the art-students. And the possession of these treasures for so long a period has never made any marked impression on British taste. Gothic has been rampant ever since. This leaning, too, has been fostered by Churchmen, who are the greatest sticklers for Classical study. Consistent country!

W. Cave Thomas.

OPEN-MOUTHED PIPES *v.* VENTILATORS.

Sir,—As the result of the experiments made at Kew, by the judges of the Sanitary Institute, with ventilators, as against plain pipes, is still commanding considerable attention, will you permit me to publish the following results showing the effect the shape of the outlet has upon the speed of the up-current.

I have recently put up at my house a 4-in. pipe about 13 ft. in height, and whose top stands about 2 ft. above the ridge. At eight p.m. last night (Aug. 9), I tried the up-current, first with the plain pipe, then I put an expanding or trumpet-mouthed outlet perpendicularly upon the top of the pipe. This being tried was taken off, and a Boyle's 10-in. soil-pipe ventilator, with 3-in. pipe attached, put on; this being also tried, was taken off in turn, and a 3-in. Banner's cowl was then tried, and the following are the results, showing the number of feet per minute which each gave of up-current:—

Plain open pipe.	Pipe with trumpet-mouth.	Boyle's.	Banner's.
200	400	300	200
200	300	200	170
200	300	200	160

In this case, the plain upright pipe with expanding outlet gave much the best results; and when at four p.m. to-day I repeated the experiments the trumpet outlet gave much the quickest up-current. The plain pipe again gave 200. The open joint where cowls turn helps to hurt their effect. I tried a drain at Dr. Cassell's house, Newton-terrace, Glasgow, which has the soil-pipe going up the centre of the house, to act as its ventilating shaft, and which soil-pipe carries off the rain-water from the centre gutter: the anemometer showed an in-current of fresh air into the drain through the ventilating-trap of 300 ft. per minute; but after running hot water down the soil-pipe the in-current rose to 500 ft. per minute.

W. P. Buchan, Sanitary Engineer.

THE NON-SOCIETY MAN'S COMPLAINT.

Sir,—You are probably aware that, at the time the masons' strike was settled, the masters' central committee sent a circular round warning the masters against any devices that might be tried, either by foremen or others, who might be favourable to the society men to the prejudice of the non-society men, giving as their reason for such a course what was only right, namely, that as the men had helped them in their struggle with the society they should defend them after they had gained the day; so that in the event of any future struggle, they, by this display of good faith, might count on the assistance of the same or similar men again. Now, sir, I wish to relate my experience of how this provision is carried out in one of the largest yards in town. I may begin by saying that I do not blame the employers in question, unless it is for not looking closely enough into the doings of the foremen in regard to the matter in question. I went there and got employment from the managing foreman, and came next day to start work, when I was told by the shop-foreman that he knew nothing about me and would give me no work. Well, I had no resource but to go back to the manager, who told me that he would make it all right, and I was to come to work at one o'clock. I did so, and was then told by the shop-foreman, with an oath, that I would have to do a great quantity of work to be worth 9d. per hour there. I make no comment upon his behaviour. I leave the facts to speak for themselves. Well, I very naturally asked him how much he considered a day's work for a man at that price; but he could not or would not tell. Well, I was sent into a shop along with some more non-society men, where, I am safe to say that, every man worked to the best of his ability for his employer's advantage; and, from what I afterwards saw, I know that we were turning out at least one-half more work per man in this shop than they were doing in the society shop. But yet we were led to understand by the foreman that we were not worth the money. Well, after being some days there, I was sent into the society shop. Now, mark the difference here, instead of the men being closely engaged at their work, as they were paid to be, they were engaged in all sorts of horseplay, as throwing bags at each other, and occasionally varying the amusements by making a war of abuse on me and other non-society men. Some were standing drunk at the banker, and the foreman would now and again present himself, and, asking if there was anything left in the bottle, take his drink, and depart again. Yet these men, in spite of all this, or, rather, I may say, in consequence of it, seeing that the foreman was a participator in it all, were all counted worthy of the full wage, while the men that attended to their work would have been all reduced, if Mr. Henshaw had not got notice of the intended reduction from one of the men, and interested himself to have it prevented. I may mention that another of the amusements the men have in this yard is the singing of some doggerel lines that some of their number have composed, about the dire vengeance they intend to take on Mr. Henshaw and some others for the share they took in having masons brought to London while the strike was on. And, in conclusion, I may say that I hope you will see your way clear to the publication of the above, as it is for the interest of the masters themselves to know how their orders are really carried out; and I am quite prepared to substantiate all I have said if called upon.

One Who Knows.

GLOUCESTER GATE BRIDGE.

Sir,—Permit me to draw your attention to the very flat roadway of the above bridge. In wet weather it will be one mass of mud, there being no curve for drainage. The parapet, I fear, is too low, and hence dangerous to those who may be tempted to take a leap, or to children who cannot resist the temptation of climbing up.

Please also notice the elaborate inscription under the solemn-looking soldiers at the park entrance recording the opening of the bridge, in deeply cut letters, displayed, and gilt, which contains the following:—

"THIS BRIDGE AND APPROACH ROAD
WAS
OPENED FOR PUBLIC TRAFFIC," &c.,

by the Duke of Cambridge, twelve lines being devoted to the titles of his Royal Highness.

As a vestryman once said to me "they don't want no gentlemen" at the Vestry, perhaps the same idea prevails as to grammar, though the School Board expenses are somewhat heavy on

A Ratepayer.

Another correspondent inquires why we have not spoken of the new drinking-fountain put up at one end of the bridge. Our reply is that, speaking of it as it appeared on the opening day, we could have said nothing satisfactory concerning it. Since then, however, we are glad to find the whole thing has been taken down and is to be re-arranged: so we may have a better tale to tell presently. To join on satisfactorily a figure like Durham's "Sunshine" to a huge mass of natural boulders requires artistic skill.

ST. HELEN'S, BISHOPSGATE.

The following, from Messrs. Wadmore & Baker, reached us last week too late for insertion:—

"Some time since you were kind enough to insert a communication we made through your columns of the discovery of the old west-end doorway, leading to the nuns' choir, in St. Helen's Church, which, after having been concealed with bricks and cement for upwards of 130 years, had again been brought to light. You will regret to hear that there is some danger of its being closed up again, unless some substantial interest is taken in its preservation. The churchwardens, the vestry, and parish are most anxious to restore in a substantial and suitable manner the whole of the external work, and in times when church restoration is much questioned, an examination of what has already been done will attest that it has been carried out in a careful and discriminating manner; but the necessary and substantial repair is so great that a special appeal only remains to be made to those interested in ecclesiology for the preservation of the above."

Hammersmith Mall.—The question of the embankment of Hammersmith Mall, from plans prepared by Mr. Bean, surveyor to the Fulham Board of Works, has been adjourned for a year.

A ROUND OF VISITS.

THE SOCIETY OF ENGINEERS.

On Wednesday last about fifty of the members of the Society of Engineers visited the works in progress at the New Law Courts, where they were received and conducted by Mr. Bartholomew, chief of the contractors' drawing-office. Of this visit we need not say more than that the works have made marked progress since the termination of the masons' strike. The enclosure eastward of the block of offices facing Bell-yard is now railed in, and the carriage-road and footways paved.

From the Law Courts the visitors proceeded to the extensive and old-established engineering works of Messrs. Pontifex & Wood, Shoe-lane, where they were received by Mr. Chadwick and shown over the premises. Messrs. Pontifex & Wood manufacture a great many large copper vessels, refrigerators, &c., for use in breweries and sugar refineries, and they manufacture a great variety of smaller articles in copper and brass. They also make large numbers of steam and water valves and cocks, water-closets, bath-fittings, and plumbers' requisites in general. The visitors witnessed the milling or rolling of some sheet lead, and the more interesting operation of lead-pipe making, the heated metal being forced through a matrix of the required diameter by means of hydraulic pressure, and somewhat cooled ere its exit upwards from the cylinder, whence it is wound, while still warm, direct on to a drum, till a coil of the required length or weight is obtained. It issues from the cylinder at the rate of two or three yards a minute.

Leaving Messrs. Pontifex's premises, the visitors proceeded to the works of the well-known firm of Messrs. S. Owens & Co. (formerly Clinton & Owens), of Whitefriars-street, where they were received by Mr. Clement Owens, and Mr. Coley, the manager. This firm enjoys a well-merited repute for all kinds of hydraulic and pumping machinery. Among the specialities shown to the visitors were Blake's well-known patent direct-acting steam pump, of which Messrs. Owens are the sole licensees and manufacturers for Great Britain, and of which more than 10,000 are said to be in use. It is claimed for this pump, which was first introduced in America in 1864, that its simplicity of construction, positive action under any pressure, and the perfect arrangement of all its parts, enable it to run at any speed with certainty, delivering more water, with a less expenditure of steam, than any other direct-acting steam pump. An important feature is the mechanical connexion between the movable seat (which in certain cases becomes the main valve) and the main piston. It permits the pump to run at very high speed without danger of striking the heads. The piston cannot reach the end of the cylinder, as the mechanical connexion referred to gives a lead as certain as can be obtained with an eccentric. The pump is constructed without a cylindrical valve; it has two valves, viz., main and auxiliary, both of which are plain flat-slide valves, the same as used in the ordinary steam-engine. The ports of these slide-valves are all cut out to gauge by a very compact and ingenious piece of machinery, called the "Brainard Milling Machine." The pump works well at extreme ranges of speed. A 5-in. pump, with an 8-in. steam cylinder having a 12-in. stroke, was started to work at 155 single strokes a minute, and the speed was varied down to 25 strokes. It was then run up again to a high speed, and suddenly set to an extremely slow speed. With the delivery throttled to represent a head pressure of water of 230 ft., and with an average steam pressure of 40 lb., the pump almost imperceptibly moved at the rate of 1 stroke in 12 minutes, or 5 strokes per hour, delivering water throughout. This shows the capability of the pump either for quick or slow working. Among other specialities shown to the visitors were Mann & Owens' patent gas-valves, some of which, as large as 48 in. diameter, are being made for the gas-works at Beckton.

A number of the visitors afterwards dined together.

The Tower of London.—A new guard-house has just been completed at the western end of the Tower Walk, for the use of the troops in garrison. It has been built by the Government contractor, of block granite with Bath stone facings.

WOOD PAVEMENT AT THE WEST END.

Wood pavement on a large scale is now being laid in several of the leading thoroughfares at the West End. The Marylebone Vestry have just commenced the paving of Oxford-street, between Tottenham-court-road and Regent's-circus with wood. The vestry have decided to have it done by workmen in their own employ. It is to be laid on a concrete foundation, and grouted with Portland cement, and after being completed is to be covered with tar and sand. The tender of Messrs. Waterman & Co., of Gracechurch-street, for supplying the wood in blocks, has been accepted. The Paddington Vestry are about to lay down wood pavement in several thoroughfares within their district, including Westbourne-grove, for the paving of which the tender of the Improved Wood Company has been accepted; also the tender of the London Wood Paving Company for laying down similar pavement in Radnor-place and Somer's-place; and that of the Asphaltic Wood Company for paving Southwick-street.

NEW MORTISING MACHINE.

Messrs. F. W. Reynolds & Co., have lately introduced a new mortising-machine, called the "London." The advantages claimed for this machine are:—1. Its strength combined with lightness, rendering it at once a durable tool and one easily transported from place to place. This lightness is due to an ingenious arrangement of the levers by which the fulcrum whence the power is developed is placed at the base of the machine instead of on the standard, as is usually the case. 2. Only one fixing of the wood is necessary both for mortising and core-driving, and, in the case of hard wood, for boring the holes at the end of the mortises. This is effected by means of two plungers side by side, one for the mortising chisel and the other for the core-driver and the boring apparatus, both of which tools fit into the same socket. The boring-bit is worked by a cranked handle on the right side of the machine, through a pair of mitre wheels, which are fixed. When the plunger is used for core-driving the bit is removed and a suitable tool inserted in the socket. By previous arrangements it was necessary to first fix and mortise the wood and place it on one side for core-driving, and afterwards refix and drive out the core, thus necessitating twice handling and fixing, besides requiring, in the case of large quantities, considerable space to stack the wood half done. These disadvantages are all obviated by the "London," as the wood, once fixed, is mortised, cleared of core, and taken straight to the joiner,—saving time and room.

THE PRETTY STATE OF THE LAW.

Sir,—You kindly permitted me last year to air a grievance affecting equally builder and baronet, painter and peer, labourer and lord.* May I ask the extra kindness of being allowed to say that since writing the inquiry "What is law?" I have struggled ineffectually to obtain an unanswerable answer to the question. Thousands and thousands are being spent yearly upon old and new courts, judges, their belongings and followings. Complaints are periodically made as to the "block in the law (?) courts," when, upon examination, three-fourths of each session are found to be occupied in trying to undo and in undoing the several decisions of previous sessions supposed to be legal. Three learned judges will give a unanimous opinion, or, as some would say, expound the law, upon a case. And a week after three equally learned judges, upon the very same case, will give a unanimous opinion quite the reverse. Again, one judge will issue his mandate to forbid another judge to carry out his legal decision previously come to. Is not this an expensive sort of game; and does it not greatly confirm what I have said, that there is no law, but opinion only, which could be obtained with much less expense, time, and trouble, compared with the present system? "My word is law," saith a certain quotation. But where upon earth is there a man, learned or otherwise, who can say, "My word is law," although the country is highly taxed to pay many to do so?

Let me instance a recent case interesting to the public, where a widow is supposed to have had awarded her by law a certain amount of damages for the loss of her husband. After having had her feelings harassed for five years with repeated investigations, all the amount awarded her has been sucked away by the "mistletoe-boughs" who flourish upon the trunks of those forced into our so-called law.

With regard to what is called the "Law of Bankruptcy," it has become a well-known fact, more particularly to your readers, that it is made (query intentionally) for the benefit and encouragement of dishonest debtors.

Away with all such deception. Let all future Acts of Parliament be so framed that disputes may be settled at once and for ever.

The much-prized right of appeal is a delusion and a snare, giving the verdict to the suitor with the longest purse,—to him who can carry the case farthest and take the chance of an opinion his way.

Y.

* See vol. xxxv., p. 274.

CLERKS OF WORKS AND ENGINEERS.

Last year the Littlehampton Local Board of Health entered into a contract to have a well sunk to supply the town with deep spring water, under the directions of Mr. Grantham, C.E., of London. The Board of Health lately ordered the clerk of works to report to them weekly on the progress of the works, which the clerk of works declined to do without the sanction of his chief, Mr. Grantham; and Mr. Grantham declines to allow the clerk of works to report to the Board, but offers to report weekly himself. Thereupon the Chairman, at the last meeting of the Board, proposed that the clerk of works be dismissed with a week's notice. What is the usual practice with engineers and architects with regard to the reporting of clerks of works? Ought the clerk of works to report to the engineer, or to the Board, or to both? It is said that, "No man can serve two masters without hating the one," &c. Is it desirable that a clerk of works should be put in the position of hating one party?

A Visitor.

Books Received.

Art Foliage, for Sculpture and Decoration; with an Analysis of Geometrical Form. Second Edition. By Jas. K. Colling, F.R.I.B.A. London: 150, Hampstead-road; and B. T. Batsford. 1878.

We give a warm welcome to the second edition, which has just now appeared, of Mr. J. K. Colling's "Art Foliage." The work as first issued some dozen years ago, has done good service, and has been out of print some time In the new edition the author has omitted twelve plates of natural foliage, which were in the original book, as he is about to publish a separate work on that part of the subject, and in their place has given an Appendix consisting of three chapters of letterpress, "Inlay," "Stone Carving," and "Wood Carving," and twenty additional plates of original designs. It is an excellent book of its kind, and will be found valuable by a large number of persons, and we cordially recommend it.

A Handbook on Home Life and Elementary Instruction. London: Chapman & Hall.

Many persons who recognise the value of domestic economy, and would aid the Congress founded to promote the study of it, are yet heard to ask, "But how can it be taught?" The pleasantly-written little book before us gives a fair answer to this inquiry or doubt, and sketches schemes of instruction which, if carried out earnestly, would not fail to produce good results. The Education Department should send it about.

VARIORUM.

The veteran, Mr. William Bardwell, sends us a brief historical narrative of the Royal Church and Parish of St. Margaret the Martyr, Westminster (Bardwell, Great Queen-street),—a pamphlet of 20 pages. It has no date, and may have been written some time ago. Be this as it may, however, it contains a considerable amount of interesting information compiled from the Churchwardens' Accounts, "assisted by the gleanings of others," and includes two illustrations.——*The Theatre*, which was making its mark as a weekly paper, has now taken the shape of "a monthly review and magazine," and begins well in that shape. A national subsidised theatre is advocated with discretion. The number contains two excellent photograph portraits, one of Miss Helen Terry, the other of Mr. Henry Irving, of themselves worth the whole cost of the review.

The Director of Ordnance Survey.—Col. A. C. Cooke, C.B., has been appointed Director of Ordnance Survey.

Miscellanea.

The Value of Land in Fulham.—The case of "Lord Beaumont *v.* The Metropolitan District Railway Company" has been heard at the Sheriffs' Court, before Mr. Under-Sheriff Burchell and a special jury. This was a compensation claim by Lord Beaumont for 20,000*l.* for some property at North-end, Fulham, near the West Kensington Station, and it was stated that land in the locality had wonderfully increased in value. The notice to treat was given in August, 1874, four days after Lord Beaumont had completed the purchase from Colonel Gunter. His lordship held other land in the neighbourhood, and had intended to erect a convalescent Home for the Knights of the Red Cross. The Solicitor-General, Mr. Morgan Howard, Q.C., Mr. Poland, and Mr. Eyre Lloyd, were for the claimant; Mr. Bidder, Q.C., and Mr. Pollard for the company. The evidence adduced on both sides was remarkable. Land at Kensington was at 30*l.* an acre ninety years ago, but within the last ten years there had been a great increase in its value, and it was now worth from 4,000*l.* and upwards an acre, and was becoming still more valuable. The land required by the railway was 1 a. 20 p., and the valuation was to be taken from 1874, when the notice to treat was served. The surveyors for Lord Beaumont differed, their estimates ranging from 8,000*l.* to 18,000*l.*, while the surveyors for the company were all under 3,000*l.* Lord Beaumont had, it appeared, purchased largely in the locality, and one of the points was that the railway had improved the property in the neighbourhood. Mr. Under-Sheriff Burchell ruled that Lord Beaumont was entitled to compensation for the value of the land at the time of the notice, irrespective of what he had given for it. Mr. Bidder submitted that 3,000*l.* for the land, the old materials, and the making of roads would be ample compensation to Lord Beaumont, and he invited the jury to consider that the making of the railway had increased the value of the property in the neighbourhood. The Solicitor-General claimed a full, fair compensation for the property taken by the railway according to the evidence of the value given by the surveyors he had called. Mr. Under-Sheriff Burchell put it to the jury to decide between the conflicting evidence as to the value of the property in August, 1874, when the notice to treat was given. The jury gave a verdict for 7,250*l.*—*Times*.

Southampton Board Schools.—At a special meeting of the St. Mary-Extra School Board, Southampton, on the 8th inst., the committee appointed to examine the plans (ten in number) sent in in competition for the new schools presented a report, which (according to the *Hampshire Advertiser*) commented on the plans examined,—"Pax," "Excelsior," "Clausentum," and "Exits and Entrances,"—and in conclusion stated that a selection was made between "Clausentum" and "Entrances and Exits," and after careful consideration the committee recommended the Board to accept the drawings marked "Clausentum," subject to the approval of the Educational Department. Mr. Rosoman, in seconding the adoption of the report, said there were three plans not selected by the committee, — "Thorough," "Spes," and "Keystone,"—which he thought were admirable, and deserving of mention. The report was adopted, and the envelope accompanying the plans of "Clausentum" was opened, and the chairman announced the author to be Mr. W. H. Mitchell, Southampton.

A New Lock.—We have received from Mr. Hill, of Upper Thames-street,—who for some years has made a speciality of locks and door furniture,—specimens of a new rim-lock, recently registered, which we think deserves some notice. The design is good, and quite unique, and well adapted for prevalent styles of architecture. There are no rough or sharp angles, so objectionable in ordinary rim-locks; and the mode of fixture to the door (through the flange) is preferable to the usual long screws passing through the body of the lock. The general finish is very good, and the prices seem moderate. The War Department has not been slow to appreciate these merits, as we understand Mr. Hill has orders to supply this lock for the officers' new quarters at Cyprus. The War Department are using the same article for the new military offices at York (now erecting under the supervision of Major Malcolm, R.E.), and for several large barracks throughout the kingdom.

Mr. Ruskin and the "Guild of St. George."—The *Leeds Mercury* states that an application on behalf of Mr. Ruskin, to be made forthwith to the Board of Trade for a licence directing an association to be formed, under the name of the Guild of St. George, to be registered with limited liability, without the addition of the word "limited" to its name. The objects of the association are specified thus:—1. To determine and institute in practice the wholesome laws of labour, and especially agricultural life and economy; to instruct first the agricultural, and then, as opportunity may serve, other labourers and craftsmen, in such science, art, and literature as are conducive to, or connected with, good husbandry and craftsmanship. 2. The acquisition, by gift, purchase, and otherwise, of land in any part of the country. 3. The acquisition, erection, &c., of museums and schools. 4. The acquisition of pictures, books, sculptures, and works of art and natural history. 5. The erection of dwelling-houses for agricultural labourers. 6. The holding, tilling, and cultivating, leaving uncultivated, turning into waste or common land, all or any part of the property acquired. 7. Granting loans or gifts with or without interest. 8. The doing of all things lawful and incidental to such objects.

The Turners' Company's Prizes.—The Company of Turners propose to give this year their silver medal, the Freedom of the Company, and other prizes, to any workman, whether master, journeyman, or apprentice in the trade in England, who may send in the best specimen of hand-turning in wood, diamond-cutting and polishing, and throwing and turning in pottery. The competition in wood includes turning in both hard and soft wood. The work must be all hand-turning, produced in the lathe "without special rest or tool apparatus," and the carving must be the work of the exhibitor. The competition in pottery includes terra-cotta, stonework, earthenware, and porcelain. In the diamond-cutting and polishing competition, the Baroness Burdett-Coutts, who is a member of the Company, has placed at the disposal of the Court the sum of 20*l.*, to be distributed in this class among the competitors. Past-Master C. Christopherson has placed at the disposal of the Company a sum of 10*l.* to be awarded as a prize for the best specimen of amateur work in ornamental turning, in either ivory or hard wood, executed during the period of competition. Any lathe apparatus may be used.

The New Opera House.—In the House of Commons, Mr. Whitwell asked the Chairman of the Metropolitan Board of Works whether the hoarding connected with the apparently discontinued New Opera-house on the Embankment would soon be removed, as it had for a long time been an obstruction to the footpath. Sir James M'Garel-Hogg replied that the time fixed for the final completion of the New Opera-house was the 29th of September next. Of course it was hopeless to expect that it would be finished by then; but until that date it did not seem expedient to the Metropolitan Board of Works to take any steps with regard to it. He would take care that the attention of the Board was directed to the matter, and he had already caused notice to be given to Mr. Mapleson of the hon. gentleman's question.

Death-rate.—The annual rate of mortality per 1,000 in the week ending July 20th, in the twenty English towns, ranged in order from the lowest, was as follows:—Bristol 18, Wolverhampton 20, Brighton 21, Nottingham 22, Portsmouth 23, Norwich 23, Oldham 24, Birmingham 25, London 26, Plymouth 26, Newcastle 26, Sunderland 26, Bradford 28, Leicester 30, Manchester 32, Sheffield 33, Salford 36, Leeds 37, Liverpool 38, and the highest rate 44 in Hull. The annual death-rate from the seven principal zymotic diseases averaged 9·7 per 1,000 in the twenty towns, and ranged from 3·5 and 3·6 in Plymouth and Portsmouth, to 17·1 and 20·8 in Leeds and Hull. Scarlet fever showed fatal prevalence in Birmingham, and whooping-cough and measles in Sunderland. Small-pox caused 11 deaths in London, but not one in any of the nineteen large provincial towns.

The late Mr. P. Wykeham Martin.—It has been decided by the citizens of Rochester to place in the Guildhall of the city a full-length portrait of the late Mr. P. Wykeham Martin, who represented the city in Parliament for more than twenty years, and whose sudden death in the House of Commons a short time ago cast a gloom over that assembly.

Wolverhampton Theatre.—The Theatre Royal, Wolverhampton, has been re-opened, after redecoration. A prologue, written for the occasion, congratulated the auditors on the rescue of the theatre from its supposed intended conversion into a galvanising works, a supposition founded on the fact that when the house was in the market, and no one else would buy it, Alderman J. Jones, of the Corrugated Iron Company, negotiated for its purchase; but the members of the Free Library Company have reason to know (says the *Staffordshire Advertiser*) that if the sellers had not "backed out," the theatre would now have been, not a galvanising works, but a museum for the town. When next the worthy alderman is bent on such a generous deed, may he not be disappointed. The theatre is saved to the drama; but it is to be hoped that a museum is not lost to the town.

York Buildings Water-gate.—At a meeting of the Board of Works last week, Mr. Leslie moved "That, in the opinion of this Board, it is desirable to make an additional entrance into the Board's beautiful garden east of Villiers-street by raising the York buildings water-gate to the level of Buckingham-street, and so utilising that ancient work, provided that the whole expenditure does not exceed 500*l.*" He said that the appearance of the Embankment was somewhat depreciated by the subsidence of this gate. Mr. Selway observed that the subject was worthy of attention, but objected to the adoption of the resolution, as it was against precedent. He moved that the matter be referred to the Works, &c., Committee for consideration. Mr. Leslie accepted the amendment, which was then adopted.

Izaak Walton.—A bust of Izaak Walton, executed by Mr. Bell, was unveiled in the Church of St. Mary, Stafford, by the Earl of Lichfield. The Dean of Lichfield in his address gave a sketch of Walton's life and literary labours, dwelling particularly upon his intimacy with the best and choicest spirits of the Church of England of his day as an evidence of his own intrinsic excellence of character, and upon his "Complete Angler" as the work upon which his literary fame most rested. Expert as he was as an angler, he was no less skilful as a "fisher of men," winning "the hearts of all that he did angle for."

Chester Castle.—A fire broke out at Chester Castle on Monday evening, beneath the new Nisi Prius Court, which has recently been erected at a cost of 10,000*l.* The scene was exciting, for on one side the county prisoners were incarcerated, and on the other, in immediate proximity to Cæsar's Tower, separated only from the burning building by a guard's box, a quantity of ammunition was stored. To prevent the fire from extending to this tower, therefore, was the chief object of the firemen, as an explosion would have inevitably been terribly destructive to life and property. In a short time, however, the flames were mastered.

Drainage at Bombay.—The Army Sanitary Commission have (according to the *Bombay Gazette*) issued a memorandum upon the report of the Bombay municipality for 1876, and the Secretary of State, in considering it, has desired the Bombay Government to urge upon the municipality the necessity of carrying out speedily a system of drainage that will reduce the serious elements of disease and death now prevailing in Bombay.

New Method of Lighting Street Lamps at Sheffield.—Last week some experiments under the electric and pneumatic processes introduced by Mr. Weston for lighting and extinguishing street-lamps were made at Sheffield. For the purpose of testing the pneumatic process, Mr. Weston had fitted several street-lamps with his patent burner and the necessary tubular connexion. The experiments are stated to have been successful.

Trade Unions Congress.—The eleventh annual Trade Unions Congress is to be held in the Athenæum, Bristol, on Monday, September 9th, and following days. The programme of business includes, besides Parliamentary subjects, co-operation and its relation to trade-unionism, representation of labour in Parliament, overtime, and apprenticeships.

The Exhibition of Sanitary Appliances and Articles of Domestic Use and Economy, held in connexion with the Autumn Congress of the Sanitary Institute of Great Britain, will take place at Stafford, from the 2nd to the 19th of October next.

Old Paris.—One of the oldest monuments in Paris, the Duke of Burgundy's Tower, in the Rue aux Ours, in Paris, now forms part of a group of schools created by the city of Paris. It is a square edifice, with embattled parapets. During a long time it was divided into small lodgings; in the great hall two stories had been constructed, and the guard-room was turned into a storehouse for ironmongery. The staircase of this tower is of particular interest to artists and archæologists. The stone column around which the steps wind is terminated in a capital, from which issues a representation of an oak-tree, the branches of which, covered with leaves very delicately carved, constitute the vaulted roof.

The Broseley Tileries.—Instead of saying in our description of Sidbury Manor House, "the roofs will be covered with Broseley tiles, from Staffordshire, manufactured by the Broseley Tile Company," we ought to have said *Shropshire*. What gives the preference to Broseley tiles in the market is their colour and quality, arising from the value of the clays peculiar to this district.

Court of Common Council.—At the last meeting, at the instance of the City Lands Committee, it was resolved to expend 200*l.* in providing improved ventilation for the Council Chamber, and 205*l.* in supplying each member of the Court with a medallion of Temple Bar, formed from the lead of the roof of the structure.

Art-Union of London Exhibition.—As we have already given a list of the principal pictures purchased by the prizeholders, it will suffice to say that the exhibition is now open in the Gallery of the Institute of Water-colour Artists, Pall-Mall, and includes a number of excellent paintings and other works of art.

Borough of Southport.—In answer to advertisements, the council had sixty-seven applications for two vacant situations,—assistants in the surveyor's office. They have appointed Messrs. William Gordon, of St. Helen's, and John Boothby, of Oldham.

The Post-office.—The site of the old Probate Registry in Queen Victoria-street, upon which the new Post-office Savings-bank Office will be erected, is to be purchased of the Commissioners of Works for 70,000*l.*, and charged to the Post-office vote.—*City Press.*

TENDERS

For the erection of a new wing to Springfield House, Muswell-hill, for Mr. L. H. Hicks. Mr. W. P. Griffith, architect:—

Grover	£1,632	0	0
Pocock	1,430	0	0

For new laundry, additions, and alterations to No. 7, Parsons-green, Fulham, for the London Female Reformatory Institution. Mr. W. P. Griffith, architect:—

Swan (accepted)	£400	0	0

For addition and repairs to No. 9, Wine Office-court, Fleet-street, for Messrs. R. K. Burt & Co. Mr. W. P. Griffith, architect:—

Ody (accepted)	£150	0	0

Accepted for a block of shops and offices, at Altrincham, Cheshire. Mr. George Truefitt, architect:—

Southern (joiner)	£1,800	0	0
Hamilton (bricklayer)	970	0	0
Watton (plumber)	732	0	0
Patterson (mason)	670	0	0
Hood (plasterer)	315	0	0
Ashcroft (slater)	133	6	0

For five dwelling-houses and shops, with stabling and warehouse in rear of Wandsworth-road. Messrs. Hill, Grylls, & Wilcocks, architects. Quantities supplied:—

Stephenson	£4,884	0	0
Cocks	4,788	0	0
Scrivener & Co.	4,325	0	0
Hunt (accepted)	4,117	0	0

Accepted for fireproof floors and roofing, for Mr. H. Hansom. Messrs. Hill, Grylls, & Wilcocks, architects:—

The Patent Concrete Building Apparatus Company	£200	0	0

For the making of a new road, and the lowering of a portion of the High-street, for the Harrow Local Board:—

Cowdery & Sons	£3,000	0	0
Blackmore	2,949	0	0
Metcalf	2,516	10	0
Thompson & Sons	2,500	0	0
M'Kenzie	2,210	0	0
Dover, Brothers	2,145	0	0
Rendall	1,920	0	0
Young & Nicholson	1,904	0	0
Rowland, Brothers (accepted)	1,795	0	0

For alterations at the Red Lion and Still Tavern, Drury-lane, for Mr. F. Hurdle. Mr. A. E. King, architect. Quantities supplied:—

Rogers	£325	0	0
Lidstone & Son	320	0	0
Tape	249	0	0
Millson	246	0	0
Cocks & Co.	244	0	0

For the construction of a 15-in. pipe sewer, for the Harrow Local Board:—

Thompson & Sons	£1,150	0	0
Cowdery & Sons	1,124	0	0
Metcalf	1,095	0	0
M'Kenzie	1,050	0	0
Blackmore	995	0	0
Strachan	978	0	0
Rendall	858	0	0
Rowland, Brothers	845	0	0
Taylor	767	0	0
Young & Nicholson (accepted)	615	0	0

For the erection of farm buildings, at Fetcham Park, Leatherhead, for Mr. J. Barnard Hankey. Mr. F. J. Dibble, architect:—

Hamblin, Brothers	£2,320	0	0
Heselgrave	1,967	0	0
Brown	1,716	0	0
Edser	1,638	0	0
Walker	1,271	0	0

For building a house and shop, stables, &c., at Dorking, for Mr. William Beall. Mr. F. J. Dibble, architect:—

Nightingale, Brothers	£1,954	0	0
Hamblin, Brothers	1,580	0	0
Heselgrave	1,256	0	0
English	1,255	0	0
Pledges	1,160	10	0

For alterations to house, Ewell-road, Epsom, for Mr. A. J. Ede. Mr. F. J. Dibble, architect:—

Page	£155	10	0
Chuter, Brothers	151	10	0

For foundations to warehouses, Farringdon-street, for Messrs. Pirie & Sons. Mr. G. Vickery, architect:—

Morter	£2,375	0	0
Scrivener	2,242	0	0
Dove, Brothers	2,125	0	0
Lawrence	2,104	0	0
Browne & Robinson	2,070	0	0
Hart	1,884	0	0
Crabbe	1,828	0	0

For pulling down old premises, and building two houses, with workshops, in Maroon-street, Limehouse, for Mr. Hugh Cotter. Mr. W. C. Livermore, architect:—

Poulsell	£949	0	0
Gooding	925	0	0
Harbert (accepted)	775	0	0
Palmer	765	0	0

For St. Andrew's Mission-room, Kensal Town. Mr. E. Vigers, jun., architect:—

Temple & Foster	£1,013	0	0
Wells	915	0	0
Hook & Oldrey	870	0	0
Thomas & Butland	845	0	0
Fairchild	810	0	0
Lamble	795	17	0

For sewer, at Kensal-green, for the General Cemetery Company. Mr. Henry Dawson, architect:—

Neave & Son	£685	0	0
Mowlem, Burt, & Freeman	575	0	0
Hook & Oldrey	565	0	0

For the erection of a pair of semi-detached residences, at Southall, Middlesex, for Mr. William Savage. Mr. Thomas Newell, architect. Bricks supplied by Mr. Savage:—

Kearley	£1,148	0	0
Hardy	935	0	0
Atkinson	775	0	0
Collins & Co. (accepted)	725	0	0

For forming length of sewer, road, and footpath, on the Castle-hill estate, near Ealing, for Mr. C. P. Millard. Messrs. Walter Graves & Hulbert, surveyors:—

Killingback	£610	0	0
Adamson & Sons	430	0	0

TO CORRESPONDENTS.

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